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BLUE JAY

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NATIONAL PARKS CENTENNIAL

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Associate Editors: Margaret Belcher, Anthony Capusten, J. Bernard Gollop, Wayne C. Harris, Ronald Hooper, George F. Ledingham, Robert W. Nero, Carol A. Scott.

Editorial Assistants: Carman Dodge

Circulation: Kelly Wylie, Cathy Wylie

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COVER: *Prince Albert National Park* M. Walsh

BLUE JAY

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**IN 1985,
WE'RE CELEBRATING THE
100th BIRTHDAY OF
CANADA'S NATIONAL PARKS**

Near Banff in the Rocky Mountains,
crews building the railroad discovered caverns
and hot springs. In 1885 this land was set aside
for our first national park.

Today Canada has national parks,
historic parks and heritage canals, but
many areas are still unrepresented.

The national parks centennial is
an occasion to renew our commitment to
preserve examples of our heritage
unimpaired for the benefit of all Canadians.

The centennial of Canada's national parks
is also a time to discover the heritage
that belongs to all Canadians.


Make your own centennial plans to visit
and enjoy Canada's heritage places.




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Canada**

Part of your Environment

THERE IS NO SUBSTITUTE FOR WILDERNESS



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ONE HUNDRED YEARS OF NATIONAL PARKS

BRADLEY J. MUIR, Saskatchewan Projects Centennial Co-ordinator Parks Canada, Prince Albert National Park, Box 100, Waskesiu Lake, Saskatchewan. S0J 2Y0

Across this land in 1885 steel fingers of the infant transcontinental railway pointed towards the future of Canada. The government in Ottawa, intent upon building a country by settlement of the great frontier to the west, saw the railway as the answer. The abundant natural resources were a powerful lure and according to the philosophy of the day nothing was more important than conquering nature for the benefit of the nation.

As the railway pushed west, the Rocky Mountains presented a formidable challenge to engineers, the promise of wealth to miners and lumbermen and a gift of breathtaking natural wonder to all. A trio of railway workers in 1883 discovered, among the towering peaks, the Cave and Basin Hotsprings. Unique, attractive and potentially valuable for the tourist industry the hotsprings became the subject of a 'heated' debate between the discoverers, claim jumpers, members of parliament and government land inspectors.

By 28 November 1885, the events concerning Cave and Basin had generated a new and unique concept. Twenty-six square kilometres around the hotsprings were reserved by the government, 'from sale, settlement or squatting ... for proper control ... and great sanitary advantages to the public.' It was the first National Park in Canada. Rocky Mountain Park, as it was called, was later expanded and renamed. We know it today as Banff National Park, one of the world's most famous.

The Government's intention to monopolize the natural features of the area

for development and the anticipated growth of the tourist trade left little margin for the protection of the hotsprings and the surrounding forests and mountains as significant natural environments.

Though far from being founded upon the principles which guide national parks today this was the initial step towards Canada's national park system. This system now protects our natural and cultural heritage in 31 national parks, more the 70 national historic parks and canals and over 1,000 historic sites, through numerous Agreements for Recreation and Conservation (ARCs) and Heritage River designations. Parks Canada is the administrative body responsible for these resources.

Over the decades we have seen the growth of wilderness preservation. Today this is the first role of national parks. Natural patterns and processes are to be allowed to flow unhindered as they have for countless centuries. The ecosystem approach to conservation of natural diversity is a foremost aim.

"100 Years of Heritage Conservation" is the slogan that Parks Canada has adopted for 1985, a year of celebration and renewal of the commitment to preserving for all time this land's natural legacy. The objectives of Parks Canada are ambitious both in philosophy and practice. A wide range of programs and activities are planned to help Canadians come to know the natural diversity of the national parks. It is hoped Canadians will come to understand why national parks exist and discover their distinct role in our society.



Boundary Bog Nature Trail, Prince Albert National Park

Parks Canada

Through the combined efforts of the provinces, and hundreds of groups and individuals 1985 will be a year of increased awareness of the need for protection of our natural and cultural heritage. We must also look to the future to the second century of parks and beyond. What will be the pressures of society and technology upon our national parks? How will we meet the challenges of completing the national parks system?

National parks give us a chance to glimpse the fascination of the real world, to observe life free of the dominating hand of man. They are places where we still have a hope of enjoying the sights and sounds and spirit of the untamed, unspoiled wilderness.

The Centennial of the national parks system is an occasion to reflect upon and celebrate past achievements and to step ahead towards further protection of the first Canada, wild Canada.

CENTENNIAL ACTIVITIES IN SASKATCHEWAN

Across the country this year, Canadians have been invited to join in the celebration of "100 Years of Heritage Conservation."

Interpretive activities in parks and historic sites will have a special emphasis during the Centennial. Come out and experience new excitement in your favorite programs. Spirits from the past and Boomer the Beaver, the National Parks' mascot, may be among the surprises that will liven up the show. Take part in Centennial events outside of parks—exhibits in malls, special film presentations, and displays at fairs are some of the things that have been planned.

For specific details regarding projects and activities within Saskatchewan write to **Brad Muir, Centennial Coordinator, Parks Canada, Prince Albert National Park, Box 100, Waskesiu Lake, Saskatchewan S0J 2Y0** or telephone 306-663-5322.

ELK ISLAND NATIONAL PARK

ROSS J. CHAPMAN, Chief Park Interpreter, Elk Island National Park, Site 4, R.R. 1, Fort Saskatchewan, Alberta. T8L 2N7

Elk Island, with its 194 km², is truly an island in the midst of a sea of farmland and development. A mere 32 km to the west lies Edmonton, the heartland of industrial Alberta, with its gleaming skyscrapers and refineries supplying lifeblood oil to western Canada. This year, along with the 30 other national parks, it celebrates 100 years of heritage conservation.

Five local men back in 1905 had enough courage and foresight to fight pressures to hunt and exterminate the last of the Beaver Hills Elk. The Elk, down in number to about 24, were, in the winter of 1905, to fall to the rifles of men. But the five men from the Edmonton/Fort Saskatchewan area petitioned the Federal Government to set aside a small tract of land surrounding Astotin Lake. The government would enclose the land in a fence and Elk would be driven inside. As a result of their efforts, this fenced enclosure of some 41 km² became Elk Island Park in 1906, the first Federal Wildlife Sanctuary in Canada.

Elk Island has been the foster parent to generations of rare animals and birds. Since it is the only completely fenced national park in Canada, these species can be monitored very closely.

In 1907, after the Canadian Government purchased the Pablo herd of Plains Bison in Montana, these animals were transported by railway car to Elk Island, where they were kept until a fence was erected around Wainwright Buffalo Park. The Pablo herd, numbering just over 700 animals, was the last large herd of Plains Bison in North America, and the Plains Bison was facing certain extinction at this time.

A few years after the Plains Bison had arrived at Elk Island, the fence was finished at Wainwright. The bulk of the herd was

transported to Wainwright, but a few eluded capture. Their descendants remain at Elk Island today. The present herd of about 400 Plains Bison at Elk Island are pure and disease free, and form the foundation herd for many other herds in North America.

Elk Island's wildlife management role, however, was to spread beyond its boundaries. In the mid-1920's, Plains Bison from Wainwright Buffalo Park had been shipped to Wood Buffalo National Park. This resulted in hybridization with, and introduction of disease into, the Wood Bison. In an effort to save the Wood Bison, a genetically pure herd was relocated to Elk Island in 1965. This herd now numbers approximately 217 individuals and is kept in a disease free area that is separated from the Plains Bison in the park by a 7 foot high fence and a four-lane highway. Careful management by park wardens has increased this subspecies to the extent that soon it may no longer be considered endangered.

Elk Island has been the scene for several re-introductions. The fur trade drastically reduced the populations of fur-bearing animals in the Elk Island area. The Beaver, for example, was completely exterminated. In the 1920's the park re-introduced the Beaver by releasing one pair. Unfortunately, sexing a beaver is difficult. After several years the park Beaver population remained unchanged, and it became clear that the "couple" was of the same sex. In 1941 another transplant was carried out, this time with seven Beaver from Banff National Park. The transplant was so successful that beaver soon colonized nearly every lake and pond in the park. Today the beaver population in Elk Island numbers over 2000.

Since this area of 194 km² of very rich, highly productive land is enclosed by a



Beaver

Hans Dommasch

fence, and has an extremely dense wildlife population, Elk Island is one of the most intensively managed national parks in Canada. By enclosing the first small herd of Elk behind a 7-foot high fence, an artificial barrier was created that continues to influence the management of large mammals today. The fence is responsible for two things: it keeps some animals in, and others it keeps out. This, combined with the lack of predators such as wolves and bears, has made necessary very intensive managements activities. One of the first, almost overwhelming, problems park wardens encountered was a shortage of food for the wildlife. They responded by building an abbatoir in the park in 1928, and reducing overpopulated herds of large mammals through controlled slaughter.

Until the mid-1960's, plains bison and elk populations were controlled through slaughter. However, starting in 1967, the first commercial sale of Plains Bison took place, a practice which continues to this day. Elk are no longer slaughtered, but are

trapped and donated to provincial governments and public institutions for relocation. Parks, zoos and nature reserves have received some of the surplus animals from the Elk Island herd. As a result of this program, Elk, Plains Bison and some Wood Bison have been relocated all over North America, and even abroad to countries like New Zealand.

Unfortunately, moose are still slaughtered periodically to prevent mass starvation, disease and severe damage to their habitat due to overbrowsing. New techniques being developed, however, may soon see surplus moose join the elk and bison in being relocated to new homes outside the park.

Elk Island is more than just wildlife management, however. It is a part of the Beaver Hills that has been set aside for present and future generations of Canadians. Millions of years ago a huge chunk of ice was stranded on a bedrock high, and melted to form the dead ice moraine terrain that characterizes Elk Island today. The

bumps and hollows of Elk Island and the Beaver Hills contrast sharply with the surrounding flat landscape. In the hollows a glacial silt layer traps water. As a result, nearly 20 percent of Elk Island's landscape is pocketed with wetlands.

Elk Island's knob and kettle terrain gives rise to a variety of landscape types that succeed one another. There are wetland communities at Elk Island showing stages of succession from open water to dry land. In the cattail shoreline, emergent plants such as cattails and arrowheads are the first visible sign that the cattail shoreline is drawing itself around the open waters of Elk Island's lakes. In the cattail shoreline many animals thrive, such as the Muskrat, Red-winged Blackbird, Blue-winged Teal, damsel flies and snails.

The rich nutrients from run-off and the surrounding dark soils contribute to the abundant lake and pond life at Elk Island. During the height of summer, the waters are so thick with duckweed and other minute plants and animals that visibility in the water is greatly reduced. Leeches, fresh water

snails, Water Boatmen, Fat-head Minnows and sticklebacks thrive in the nutrient charged water. In turn, these eutrophic waters become home to thousands of waterfowl, including coots, common loons, red-necked grebes, and a host of ducks and geese.

In a sedge meadow you will often see a central cluster of cattails. The roots of the sedge hinder the establishment of other species. Frequently, the meadows flood in spring. In winter, bison are often seen grazing in sedge meadows.

Scrubland meadows occur in depressions that once were ponds. There are two types of scrubland meadow at Elk Island. The wet type has several kinds of small willows and is characterized by a variety of sedges and coltsfoot. The dry type has reed grasses, which have displaced many of the sedges.

Close to 80 percent of Elk Island is covered by dryland communities. The predominant community is the poplar dominated mixedwood forest. Here the Trembling Aspen is most widespread. Birch and Balsam Poplar are of lesser importance.



Plains Bison, Elk Island National Park

Parks Canada

The layering of the forest community (herbs and grasses, shrubs, and trees) provides a variety of habitats for birds and mammals. Moose, Porcupine, Hoary Bat, Yellow-rumped Warbler, Hairy Woodpecker and Northern Oriole frequent this community. Common plants include Pin Cherry, Saskatoon, Red-osier Dogwood, hazelnut, Prickly Rose, baneberry, Bunchberry and Sarsaparilla.

Scattered in stands throughout the park, and on the islands of Astotin Lake, is the white spruce. Birch, poplar, Wild Red Raspberry and Dwarf Mistletoe are associated with the spruce. Ruffed Grouse, Yellow-bellied Sapsuckers, Pileated Woodpeckers and Red Squirrels frequent this forest type. The island spruce are survivors of the 1895 fire that swept the park, as are the spruce remaining on north-facing slopes, where spruce seedlings commonly have the best chance of establishing themselves.

A parkland type of community is also found in Elk Island. This community is a

blend of grassland and open stands of Trembling Aspen. Outside the park, Rough Fescue and aspen are interspersed in the aspen parkland, however, owing to fire suppression and heavy grazing by park ungulates, the fescue grasslands within the park have been modified.

Elk Island is also a place for people; it has an annual visitation rate of close to 500,000 people. With over 90 km of trails, it has become the most popular area close to Edmonton for cross-country skiing. In the summertime, because it is less than an hour's drive from Edmonton, Elk Island is frequently included in a tour of the greater Edmonton area. The huge density of large mammals in the park (over 2000), and its 217 species of birds, make the park popular with nature lovers.

An interpretive programme is offered in the park seven days a week at the new Astotin Interpretive Centre, located in the Sandy Beach area. This year the emphasis of the interpretive programme is on the 1985 Centennial of parks in Canada.



Handling Elk, Elk Island National Park

Parks Canada

PRINCE ALBERT NATIONAL PARK — AN INVITING WILDERNESS

MERV SYROTEUK, Parks Canada, Box 100, Waskesiu Lake, Saskatchewan. SOJ 2YO

Between the multi-colored, granitic dome of the Canadian Shield and the craggy white peaks of the Canadian Rockies lie the Interior Plains. This vast, level landscape stretches from the south-central United States northward and follows the MacKenzie Valley to the Arctic Ocean. Over most of North America, grasslands and desert vegetation predominate, but from central Saskatchewan northward, the grasslands gradually yield to aspen parkland and finally to boreal forest.

Interpretive Themes

Owing to the immense size of the park, its complex landscape and the variety of experiences and impressions available to the visitor to Prince Albert National Park, five interpretive themes have been developed. Although they have a tendency to simplify the complexity of the area, these themes capsulize the essence of the park and its significance:

- Landscapes of the Southern Boreal Plains
- Transition
- Boreal Wilderness
- Grey Owl
- Heritage Resources - Pelicans, Bison and Grasslands

Landscapes of the Southern Boreal Plains

The Southern Boreal Plains extend from southwestern Manitoba across the prairies to northeastern British Columbia. This ancient landscape began evolving some 500 million years ago with inundation by marine waters forming inland seas. Sedimentation, evaporation and solidification produced limestone and shale, the basement foundation of our present day landscape. This bedrock foundation is now buried beneath glacial drift deposits. The distinguishing features today, are therefore those of a

young landscape, one sculptured by its recent icy past.

During the Wisconsin period, the Thunder Hills to the north of the park separated the advancing ice sheet, creating two lobes which gradually engulfed the park area. The western lobe advanced southeastward to create the oriented landforms and drainage patterns found in the Amyot Lake - Sturgeon River area in the southwest corner of the park. The other lobe moved southwesterly to scour out the basins occupied today by Kingsmere and Crean lakes and to create the ice thrust ridges so evident near Hunters Lake.

Evidence of the glacial retreat some 12,000 - 10,000 years ago is everywhere. Most impressive are the morainic deposits forming the 'Spruce River Highlands' and the uplands north of the MacLennan River.

It is only to the inexperienced visitor that the park landscape appears similar and monotonous. A variety of glacial landform features consisting of eskers, kettles, kames and recessional moraine adds infinite variety and physical relief. Influenced by glacial deposits and the sorting action of meltwaters, a forest mosaic has developed with aspen uplands, spruce bogs, jack pine ridges and sedge meadows. These form a complex, intricate vegetation pattern, broken by deep channels carved by glacial meltwaters.

Transition

Another factor making it more difficult to appreciate the forest mosaic typical of the park area is the subtle nature of the transitional change from aspen parkland to boreal forest. Aspen dominates the southern portion of the park, where pockets of fescue grasslands are also found. The



Crean Station, Prince Albert National Park

P. Robinson

boreal landscape is best experienced in the central and northern areas of the park. Representatives of the boreal component are Moose, caribou, wolf and Wolverine; while ground squirrel, Badger and White-tailed Jack Rabbit can be found in the grasslands and aspen parkland area.

Located on the edge of this great northern forest, Prince Albert National Park is representative of the Southern Boreal Plains, a subdued landscape formed by gentle and gradual processes, by the incursion of marine waters and the gradual sedimentation of these ancient inland seas. It is a landscape with a subtle beauty that tends to calm rather than excite. For this reason people often perceive the park as being subtle with an unassuming character.

This vegetative transition has influenced the cultural and historical use of the park. Archeological evidence suggests a plains culture and forest culture traditionally intermingled in this area during the winter season, dispersing in spring to radically different subsistence patterns. Bison migrated to the shelter of the forest during the harsh

winter and together with Moose, Elk, and deer, provided the native population with a source of food.

Only the odd scattered arrowhead, spear point and stone flakes remain as evidence of man's past activities here. The remains of an unimportant fur trading post, the ruins of sawmills and rotting stumps of lumbered trees, overgrown cart trails and disintegrating, shrub-choked foundations of the depression-era work camps are evidence of a period in time when commerce was important in the park area.

The value of this landscape and its significance to the national heritage was not recognized until 1927 when the area was set aside as a national park: a promise to all Canadians that it would remain untouched by man's activities. To many people, Prince Albert National Park in 1927 seemed nothing more than a large tract of land in the wilderness setting of north-central Saskatchewan. But intensive land use practices outside the park have rendered the park area a wilderness island today. Clear-cutting pulp operations have encroached



Sturgeon Hillsides

A. Landry

upon the boundaries of the park and farmland fringes the park on the south and west.

Boreal Wilderness

In spite of these massive landscape changes surrounding it, you can still get the impression of the boreal wilderness when you visit the park. As you travel northward the well defined road patterns and survey system so characteristic of the southern landscape gives way to roads that appear as mere lines wandering through the boreal forest. It is this 'northern image' combined with the vast area of the park - 3,875 km² - which evoke the feelings of boreal wilderness.

The perception of boreal wilderness is something different for everyone, yet to most it means broad expanses, peacefulness, northern lights, mosquitoes, blackflies and unending silence broken only by the howl of a wolf. These qualities are typical of the boreal wilderness experience in the park today. The vastness and subtle beauty of the back-country are the most im-

portant qualities of the boreal wilderness experience. It is an experience that is further fashioned by the forest communities. The aspen uplands give a feeling of an open, friendly wilderness, whereas the spruce forest creates an impression of a dark, closed-in and threatening wilderness.

The variety of moods is not confined solely to the impressions created by the character of the forest communities and the vastness of the park, but is also tied closely to the seasons. Transition from one season to the next is not sudden but a gradual fading of one into another as nature casts her spell over the landscape. From the white silence of the boreal winter through to spring with the quiet trickle of water and flights of birds overhead and the arrival of the loon whose haunting call makes known its presence in the northern wilderness, so the seasons blend. Summer is upon us in late June with long warm days, mosquitoes and violent storms. Days shorten to signal the arrival of autumn. The forest mosaic is a blanket of colour and the sounds



Gray Wolves

M. Syroteuk

associated with a wilderness setting again prevail. The bugling of Elk and howling of wolves make us realize that the park is a special place.

Unfortunately, few visitors experience these changes, for the majority confine their travel to a single season and to the townsite of Waskesiu where the focus is upon recreation; golf, tennis, lawn bowling and the pleasures of a relaxing afternoon on the beach, where the reverberating sounds of music are heard against the wilderness backdrop that surrounds the townsite. As suddenly as the bustling activity of Waskesiu begins in July, it ends in late August and once again the townsite returns to a peaceful state.

Grey Owl

Inspired by the serenely beautiful and wild landscape, Grey Owl, a gifted orator and author lived at Beaver Lodge on the shores of Ajawaan Lake. Three of his books were completed while at Ajawaan and it was to the peace of Ajawaan that he returned after his lecture tours in Great Britain and the United States. Grey Owl died in 1938.

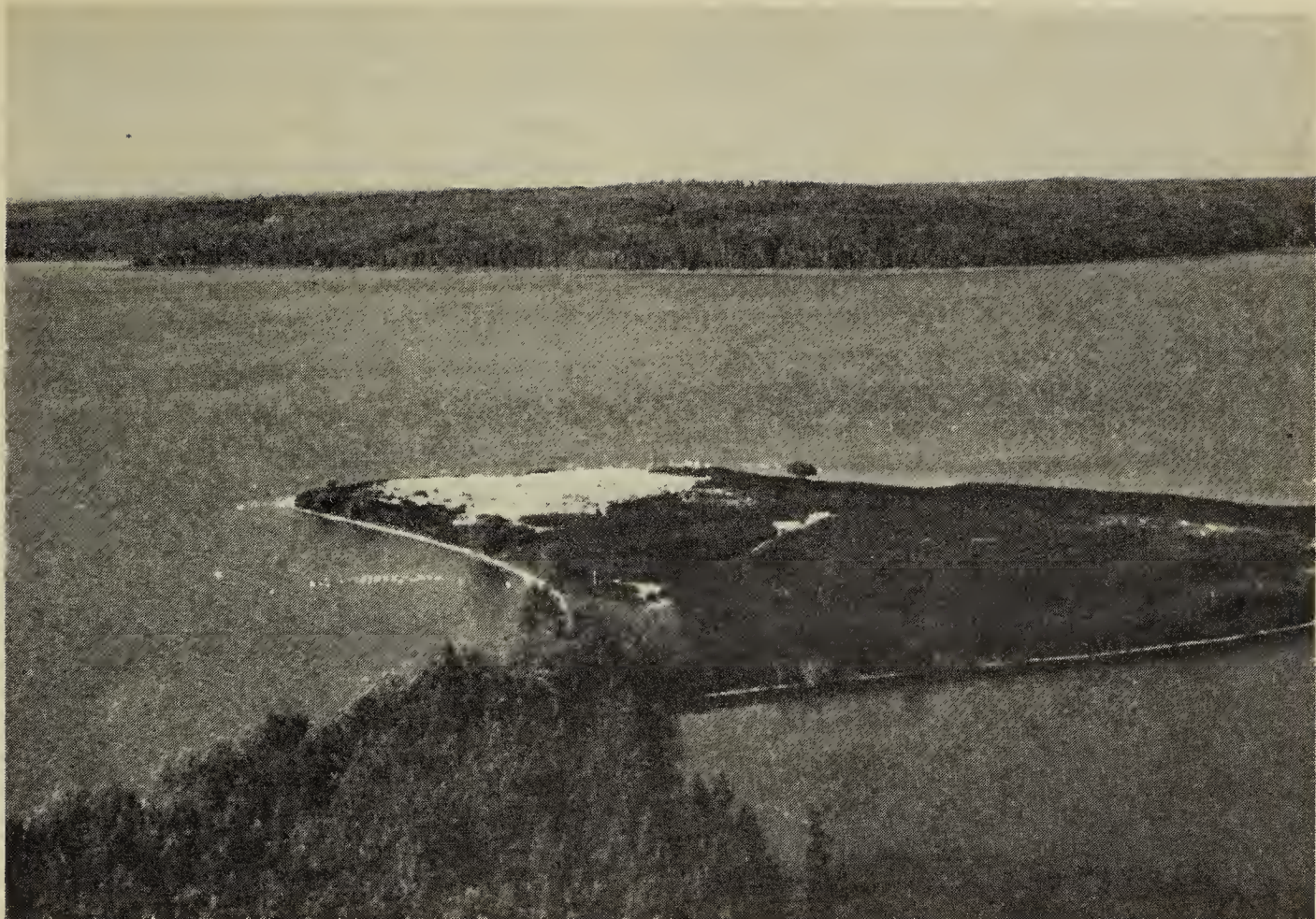
His primitive log cabin and grave site, Anahareo's cabin and a few plaques remain to remind us of his life here in the park.

Heritage Resources

Perhaps one of the most significant resources preserved is the American White Pelican colony on Lavallee Lake in the extreme northwest corner of the park. Afforded protection by its Class I zoning status, where access to the colony is allowed only by special permit, the colony has continued to increase in size and is believed to be the second largest colony in Canada today. Here some 7,000 birds return each spring to nest.

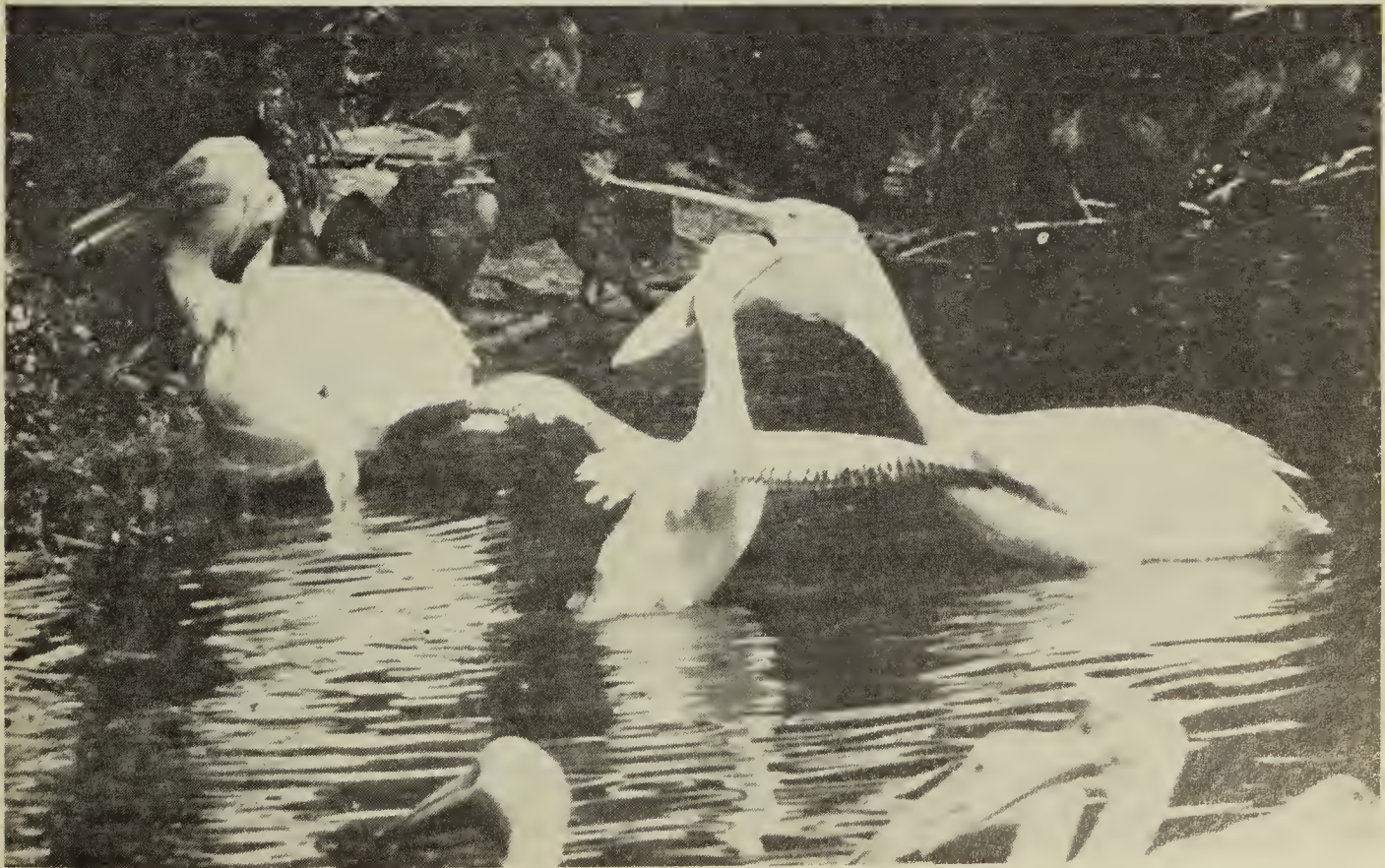
The isolated fescue grasslands located in the southwestern portion of the park have continued to increase in significance. It is estimated that about 90 percent of the fescue community has been altered through grazing, ploughing, and haying. Approximately one-third of the existing relict fescue grasslands remaining in Canada is found here. This representation within the park is not only significant because of this community's depletion elsewhere, but also because it is perhaps the northern-most representation of this community in Saskatchewan. The fescue grasslands in the park area are continually being altered by the invasion of aspen suckers and snowberry. To assist in maintaining these grasslands a prescribed burn program is being implemented. This involves the controlled burning of these areas at predetermined intervals.

There are very few locations in Canada where bison are permitted to roam freely. Within the park a herd of 26 animals forage for themselves; migrating seasonally to the fescue grasslands and sedge meadows in the southwest each spring, returning northward each winter to the protection of the boreal forest. The herd's novel beginning was in 1969 when 50 bison were transferred from Elk Island National Park, Alberta to a release site in the Twoforks River area about 80 km. north of the park. The herd



Pelican Island

Parks Canada



Pelican feeding young

Parks Canada

dispersed from the release site and three animals migrated to the park. Establishment was slow but now the herd is increasing at a rate of 2 - 3 animals annually.

Conclusion

Regardless of the season, whenever you visit the park, take your time, for the sights, sounds and discoveries remain hidden to the hasty traveller and those who confine their exploration to Waskesiu. Remember too, that the monotony of the landscape is only apparent; there are changes, contrast and complexity everywhere. Varied glacial landforms contrast with mosquito-choked muskeg and patches of relict fescue grassland. The character of the landscape is composed of a strong boreal flavour, gradual transition and the silence of

wilderness. Grey Owl once said:

We need enrichment other than material prosperity and to gain it we have only to look around at what our country has to offer we have something here that no other country has.

I challenge you to experience Prince Albert National park where the structured landscape of man gives way to unstructured, enduring landscape of the northern wilderness. For some, that will entail a back-country outing, for others a fleeting look at places that still remain wild. Whatever you plan; your enjoyment should be increased by the knowledge that it is yours to enjoy today and will be there for future generations to share tomorrow.



Smoothstone River

Parks Canada

RIDING MOUNTAIN NATIONAL PARK — MUSEUM OF NATURE

JEWEL THOREN, Riding Mountain National Park, Box 108, Onanole, Manitoba.
ROJ 1NO

Riding Mountain National Park, Manitoba is in the central region of North America. Its location and geology contribute to its character. The uniqueness lies in the combination of these factors; all contribute to the meshing of three major ecosystems and therefore to the myriads of species of flora and fauna to be found here.

Landforms and Their Sculpturing

From west to east the terrain is gently undulating. The eastern edge of the escarpment drops 475 m to the Manitoba Plains. The bedrock of the Park dates back to the Permian and Cretaceous Periods (Age of the Reptiles). At that time a semi-tropical sea covered much of this area leaving sediment

that formed the shale bedrock foundation of the mountains. Fossils of molluscs and reptiles can be found in the ancient shale bedrock formation.

Evidence of volcanic activity is found in the shale of the escarpment. A layer of time-altered volcanic ash (bentonite) occurs. Originating with the mountain-building processes of the Rocky Mountains this ash settled in the area and subsequently hardened and was compressed to about 3 cm thickness. Bentonite is unstable and can cause landslides or slumping along steep slopes. On Bald Hill landslides have exposed the ochre-coloured bentonite layer.



Bald Hill on the escarpment, Riding Mountain

Parks Canada

Other layers have contributed to maintaining the face of the escarpment. The caprock of Odanah shale is silica-rich, and more resistant to erosion. The shale beneath is softer and erodes from below until the Odanah shale breaks off. This erosion and collapsing maintains the sharpness of the escarpment.

Debris deposited by the Wisconsin glaciation on the shale bedrock created undulating recessional morainic plains, hummocky knob and kettle terrain, glacio-fluvial channels, rolling terminal moraines and outwash plains. Glacial erratics (granite, basalt, limestone and chert boulders) were brought by the glaciers from the Canadian Shield.

Water and wind erosion has maintained the striking sculpture that is the Escarpment. A great river flowing through Western Manitoba 70 million years ago eroded the bedrock to form its first face. Glacial rivers flowing off the escarpment carved out the notches now cradling the Ochre and Vermilion Rivers. Glacial Lake Agassiz created

several beach ridges paralleling the length of Riding Mountain National Park. These can be seen on Beach Ridges Trail at the northern edge of the Park. Rivers flowing into the Glacial lake created fluvial plains which are now rich agricultural land.

Present day erosional forces of frost, rain and flowing water continue to reshape the land. Rivers continue to cut into the shale as they flow off the escarpment.

The Park Today - From West to East

Riding Mountain National Park from the western grassland to the eastern escarpment supports a rich and varied flora and fauna.

The Western Region

The Birdtail Valley in the western end of the Park supports a large population of ungulates. Running from Deep Lake to the Sugarloaf Hills, it is especially significant as the winter feeding grounds of the Elk.

The Birdtail Bench and the Sugarloaf Hills support the most easterly distribution of Rough Fescue prairie in Canada. For this



Sugarloaf Hills and Birdtail Valley

R. Walker



Elk

G.W. Seib

reason the Birdtail Bench was designated as an international biological site by the Canadian Committee of International Biological Programs. Such sites are recognized internationally as requiring special protection because of their biological significance to the world. Moose Lake Forest is a completely intact example of an aspen biotic community. For this reason, it too, has been designated an international biological site.

The beauty of the grassland interspersed with small glacial lakes, Beaver ponds, aspen and spruce is unsurpassed. Rolling hills afford magnificent vistas. You can stand on the Sugarloaf Hills and gaze down on the wide valley with the meandering Birdtail Creek, the remnant of a once torrential glacial river. Turning you will see 80 acres of Rough Fescue prairie. You may catch a glimpse of an Osprey, eagle, or even Cougar.

Lake Audy Area

Prairie flowers and herbs decorate the rough Fescue grassland edging the quiet

waters of Lake Audy. Remnant mature White Spruce stands survived the logging in the area.

A small herd of plains bison graze on the Lake Audy Plain. Driving trails and wheelchair access gives the handicapped person an excellent view of the bison range and exhibits. Interpretive panels include prehistory, history and interesting facts on the ecology of this great mammal, which once roamed freely here before it became an endangered species.

There are three biological sites in the Lake Audy area. Whitewater Lake is a major waterfowl breeding and staging area as well as a major Elk calving area. The region of wet meadows and prairie potholes south of Lake Audy is known throughout North America for its waterfowl productivity. Shoal Lake Marsh community is an excellent example of an old lake with typical plant associations of cattail, bulrush and reedgrass. It combines excellent waterfowl and Moose habitat.

Grasshopper Valley

Here there is gently knolled land with lovely meadows edged with aspen. In spring, beautiful white blossoms appear deceptively innocent hiding the long, sharp thorns of the gnarled hawthorn bush. Summertime Yarrow, Indian Blanket, Blazing star and yellow-green grasses attract many insects.

In winter, you may see or hear Elk pawing their way to forage beneath the snow. Large poplar and giant spruce interspersed with small meadows and willow make up an oddly mixed wet and dry area. Across the Minnedosa River is a campsite next to gently, rolling terrain along the western edge of the Bison Enclosure.

Strathclair Road

The Strathclair Road, an old pioneer trail, proceeds north across the park to Vermilion River Warden station. The trail provides scenic views with many open meadows around Kinnis creek. Elk may be seen year

round. Vermilion River and Buck Creek host the curious , playful River Otter, a species that is rarely seen in the rest of the park.

Sedge Meadows and Black Spruce

East of Lake Audy are sedge meadows and small basins. There is a great diversity in the age of the mixed boreal forest, through successional transitions, culminating in mature spruce. The upland of mixed boreal forest is dominated by 150-year-old Black Spruce and Tamarack bog. These can also be found in the Boreal Island Trail off No. 10 highway.

The Central Region

Loons Island

Loons Island trail meanders along Lake Katherine through stands of Paper Birch and diverse mixed boreal forest. The trail leads out to the lake. You can see a miniature island where loons nest in quiet tranquility. This is one of the few areas in the Park



Yellow Lady's-slipper

Wayne Lynch

where the delicate blue Kalm's Lobelia can be found. The trail extends through pine, aspen, fir and birch. An understory of Chokecherries, Saskatoons and cranberries all present white blossoms in spring.

Evergreen Trail

The Evergreen Trail provides a novice hiker with a mini-view of the Park. You will find bog, meadows, spruce-pine forest and aspen woodland. Tiny, delicate, pinkish-white bells of Twinflower rise above the Sphagnum moss of the bog. You can find Round-leaved Orchis, One-flowered Wintergreen and Labrador Tea. Canada Anemone, Western Red Lily and Hoary Puccoon can be seen in the meadows. You may even see the Yellow Lady's-slipper in the damp woodland. Indian legend tells how a woman ran through the winter snows to bring medicine to her people. She was exhausted, her feet were cut and bleeding from frostbite. She was named Wah-on-nay for her sacrifice. On her death, her foot wrappings became little flowers of yellow known as Wah-on-nay moccasinum or lady's slippers.

The Eastern Region

In 1980 a fire swept over 194 km² of the park, blackening some areas and jumping over others. The burning of the thick layer of litter released nutrients for new growth on the bare soil. Regrowth has been rapid. First were Fireweed and asters, brightening the land. Suckering shoots from birch, poplar and shrubs soon appeared. The variety will exceed that of the climax vegetation present before the fire providing the beginning for a rich, new forest.

The intense heat melted the resinous bonds of the many jackpine cones releasing their seeds. Young pines are already up to one metre in height.

The leaves of the deciduous trees didn't burn as easily as the needles of the conifers. Many were scorched rather than killed. Green trees continued to edge the beaver pond off highway # 19. Here Moose dip their heads beneath the water for submerged plants. Grouse, warblers, deer, Elk and Moose are already moving into the area.

The lookout on # 19 highway gives you a picturesque view. You can see over the escarpment to the Manitoba Plains. On a hike to Gorge Creek you go down the ravine to the creek. Climbing the other side you view the valley, with a fairly steep trail running through aspen, Balsam Poplar, elm, ash, Mountain Maple, honeysuckle and Wild Plum. There is Ostrich Fern, meadow rue, sedges, bedstraw, and Poison Ivy. If lucky, you may also see bear, Elk, rabbit Coyote, Bald Eagle or even a Cardinal. Along the Oak Ridge Trail by Agassiz Ski Hill there are great oak stands with an understory of hazelnut.

Museum of Nature

Riding Mountain National Park is a museum of nature preserved intact so our descendants may see what we can enjoy now. Here there are scents and sounds to experience as well as sights. There are no bars for viewing, just wide open spaces where animals and birds wander at will. The pesky mosquito, gossamer-winged butterfly, Great Blue Heron, tiny wren, shy Lynx, regal Elk, comical bear and the Moose are all present in their natural environment for those who can hike to see.

Hear the sounds, smell the scents, catch the fleeting experiences as in the iridescent sunsets. No artist can resist putting paint to canvas, to try to capture Mother Nature's beautiful works in Riding Mountain National Park.

GRASSLANDS NATIONAL PARK

GEORGE F. LEDINGHAM, Curator of the Vascular Plant Herbarium, University of Regina, Regina, Saskatchewan. S4S 0A2

The Saskatchewan Natural History Society was recently recognized by Parks Canada

for its efforts in publicizing the need to preserve an area of prairie grassland. The



National Heritage Award

Presented by Parks Canada
On behalf of the Canadian people to

Saskatchewan Natural History Society

To record our thanks for the exceptional
work and effort that contributed greatly
to the establishment of Grasslands
National Park.
Thank you.

A handwritten signature in cursive script, reading "Suzanne Blais-Grenier".

The Honourable Suzanne Blais-Grenier
Minister of the Environment

The word "Canada" in a stylized, bold, serif font, with a small maple leaf above the letter 'a'.

handsomely framed National Heritage Award was presented to representatives of the Society at a noon luncheon in the historic Railway Committee Room on Parliament Hill, 18 February 1985.

The heritage award to the Saskatchewan Natural History Society was received by Robert Coupland and George Ledingham. The former was long-time head of the Department of Plant Ecology in the University of Saskatchewan and is an internationally respected grassland ecologist. The latter is a founding member of the Society who for many years was chairman of the Society's grasslands park committee. Both had acted on a committee formed to promote the preservation of native grasslands. Both had acted as guides on the International Botanical Congress grasslands tour through Alberta and Saskatchewan in 1959.

Six awards in all were presented by Dr. Suzanne Blais-Grenier, Minister of the Environment, who noted that from one small Banff National Park established in 1885 there are now national parks in every province and territory and also hundreds of historic sites. The Minister praised the many volunteers who over the years had done so much to increase awareness of the importance of natural and cultural heritage during the first one hundred years of Parks Canada. She promised that more would be accomplished in the second century, by "inter-governmental as well as public/private participation."

The Saskatchewan Natural History Society first discussed the possibility of the formation of a national grasslands park in 1957 when the guest speaker at its annual meeting stated that Parks Canada wanted to preserve each kind of habitat and that the first priority of Parks Canada was preservation, not recreation. For some years the Society attempted to persuade the Province of Saskatchewan to set up one or more grassland preserves. Finally in 1963 it passed the resolution requesting the provincial and federal governments to establish a National Park in the grasslands.

The idea was not new. Catlin in 1832 had proposed a large reserve to preserve bison and Indians! Later, when the antelope were close to extinction, three small grassland National Parks had been established but these disappeared when antelope populations recovered. The Society's proposal, however, differed from previous proposals which had been aimed at protection of one of two specific species. The aim of the Society was to preserve the whole complexity and beauty of a significant amount of Canadian prairie. To make this aim clear it prepared a rationale and chose the area (up to 900 square miles) between Killdeer and Val Marie, an area which it considered suitably unmodified by modern agriculture.

After making its request for a National Grasslands Park members of the Society wrote hundreds of letters. Sometimes the obstacles to the establishment of a park in this ranching area seemed impossible to overcome. Finally, in 1975, public hearings were held, but even though the hearing board recommended the establishment of a park, intergovernmental negotiations continued. Now, the federal government is slowly acquiring property and already it has forty or more square miles. However, there is still cattle-grazing in the area and the provincial government continues to hold the mineral rights. H. Lorne Hansen, the Park Superintendent, has a Parks Canada office in Val Marie and invites anyone interested in grasslands to visit though at the moment the boundaries of the park have not yet been established. Indeed, the transition period may last for another five years and even then it may take several more years for the Master Plan to be developed.

To celebrate the Parks Centennial special events will be held this summer in Canadian National Parks. There will also be Parks Canada exhibits in prominent places in many Canadian cities. The Saskatchewan Natural History Society, in support of Parks Canada, is planning to hold its summer meeting in the Val Marie area during the weekend of June 7 - 9. Members hope to visit the prairie dog cairn located in the



Stone cairn at Prairie Dog Colony near Val Marie

G.W. Seib

quarter section leased by the Society in 1964; they will also visit the rattlesnake hibernaculum, 70-mile butte and other interesting areas. Living ecosystems will interest naturalists primarily, but esthetic, cultural, archeological and paleontological sites will also appeal to many people.

It is reassuring to members of the Society to know that some of this important Canadian habitat will soon be preserved in a National Park. However, with the existence of ever-increasing world populations, National Parks in every country are under serious "people pressure." By establishing this park now and developing its Master Plan with knowledge of what is happening elsewhere, Parks Canada must include rules which will ensure that preservation has the highest priority. Rare plants and animals must be protected, for the whole ecosystem is fragile. And not only are biological sites important. Archeological, paleontological, cultural and aesthetic sites are also vulnerable.

As naturalists, we are optimistic that, when exploitation of natural resources in the area ends and the National Park is finally established, the preservation of native plants and animals will be the prime objective of the park. One problem, nevertheless, remains, the problem of the existence of exotic species which have been accidentally (or intentionally) introduced into the area by ranchers and farmers. All areas acquired by Parks Canada will have to be carefully examined for such exotic plants and animals. If these should prove to be aggressive species which will disrupt populations of native species, they must be controlled or, preferably, eliminated.

Another problem relates further to the aforementioned "people pressure." It would be unreasonable to give up the agricultural use of the area only to allow overuse by tourists, campers and recreationists. Big national parks try to solve the use-versus-preservation conflict by zoning

parks. This park will not be large enough for such a compromise. There must, therefore, be strict control of access to the more fragile parts of the park. Disruptive activities such as camping, horse-back riding, etc. which may be associated with the park can be developed either in the buffer zone surrounding the park or in adjacent towns.

The Society is grateful for the recognition accorded to it by Parks Canada and the people of Canada. In return, the Society promises to continue to work for the development of a National Grasslands Park which will be consistent with its aim to preserve all aspects of our Canadian heritage.



Killdeer area

Frank Bellamy

SANCTUARIES IN CANADA

P.S. TAYLOR, Canadian Wildlife Service, 115 Perimeter Road, Saskatoon, Saskatchewan S7N 0X4 and C. JORGENSEN, CWS, Box 280, Simpson, Saskatchewan. S0G 4M0

While encamped near the head of this lake in 1879 we had ample opportunity to examine this portion of the country. Multitudes of pelicans, geese, ducks, avocets, phalaropes, water hens and grebes besides innumerable snipe and plover were everywhere, in the marshes at the head of the lake, along its shores or on sand islands lying to the south of the camp. This was early in July and experience tells one that not one tenth was then seen of the bird life assembled in September and October. J.A. Macoun, 1879.

When the first yellow, peach, and pale green flares of dawn thrust upward to pierce the prairie night, the clamor of myriad birds fragments into the individual voices of a dozen species. Cranes, geese, ducks, swans, shorebirds — all join the welling chorus in growing agitation, stimulated by their hunger and the arrival of the day.

The full vermilion majesty of sunrise fills the eastern sky as the birds take to the air. Family units, then small flocks, then great skeins, wedges, and brigades of glorious birds begin to stream past in striking silhouette. Cranes are shy birds, and will veer off course at the first sight of you, so it is wise to keep still, and well hidden. The rolling resonant calls of the cranes and the ridiculous thin peeps of their young-of-the-year predominate, punctuated by the stirring honks of big gray Canada Geese and the high-pitched giggles of White-fronted Geese ... Throughout, Mallards quack sturdily, American Widgeon whistle, and the first pipits of the day lisp faintly overhead. J.A. Livingston, 1965.

In March 1887, Edgar Dewdney, then the Lieutenant-Governor of the Northwest Territories, wrote to Thomas White, Minister of the Interior urging him to reserve the islands of Last Mountain Lake as a wildfowl sanctuary, because rare pelicans nested in the region and during the breeding season the shorelines of the islands were "literally covered with eggs."⁴ On 8 June 1887 the federal government reserved the first area for wildfowl in Canada at the north end of Last Mountain Lake (Long Lake) in what is now south central Saskatchewan; this area contained approximately 2,534 acres:

"whereas the Minister of the Interior has reported that the islands and shores of the northern end of Long Lake, in the North West Territories, are favourite breeding grounds for almost all the different varieties of wild fowl in that country, and that it is very desirable that steps be taken to retain these grounds for such purposes especially in view of the probable extension of the Long Lake Railway, and the consequent settlement of the land in that neighbourhood.

His Excellency in Council....hereby ordered the following lands which are vacant and unsold, be, and the same are hereby reserved from sale and settlement, and set apart as breeding grounds for wild fowl..."

Sanctuaries in other provinces were not established until 1920, so Saskatchewan has the distinction of having the first bird sanctuary in Canada, indeed, in North America.

Murray recounts in detail the rather uneven history of the sanctuaries in Saskatchewan up to 1965, and it makes for interesting reading.⁸ In 1917 the Canadian



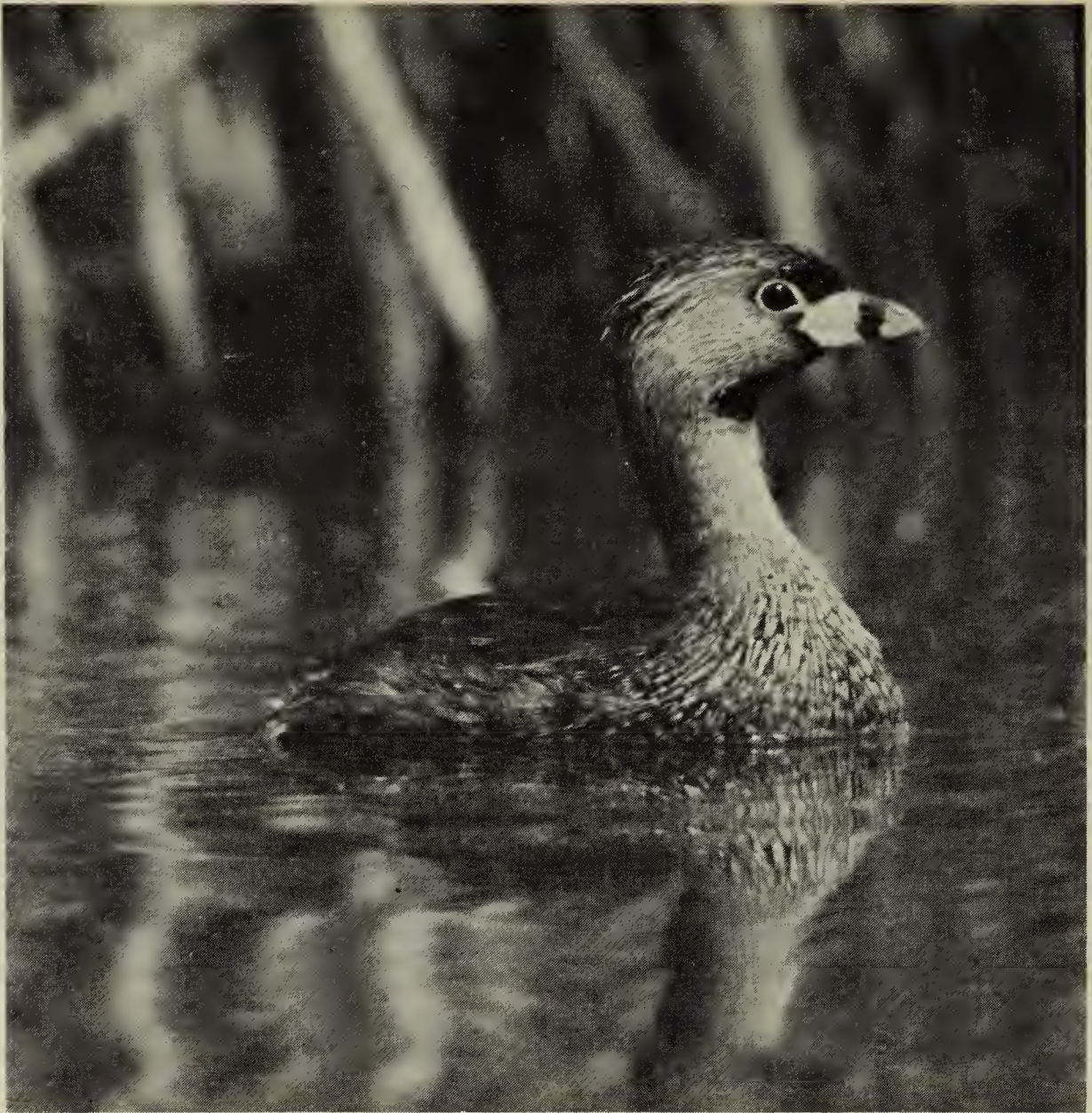
Perry's Point, foreground, and the islands at the north end of Last Mountain Lake were protected as Canada's first sanctuary for birds in 1887. White Pelicans nested successfully in the sanctuary in 1984 after many years of non-breeding.

P. Taylor

Parliament passed the Migratory Birds Convention Act and eight years later, twelve sanctuaries were formally established. These were: Last Mountain Lake, Lake Johnstone (Old Wives Lake), Quill Lakes, Lenore Lake, Basin and Middle Lakes, Chaplin Lake, Crane Lake, Bigstick Lake, Cabri Lake, Whitebear Lake, Redberry Lake, and Manito Lake. Soon after, the Experimental Farms at Indian Head and Sutherland were added as sanctuaries. These original sanctuaries included both the waters and islands of the lakes and, except for Cabri Lake, all vacant quarter sections of land immediately adjoining the lakes. Those lands had been reserved in 1915 to facilitate the establishment of the sanctuaries and prevent their sale and settlement.

Grazing leases in existence before the sanctuaries were established were modified so that they were only valid if the restrictions on wildlife were observed.

In 1925 Public Shooting Grounds were established to complement the sanctuaries, "to encourage and foster a spirit of sportsmanship" and protect more wetland and upland habitat for wild fowl throughout the year. These were the following lakes: Good Spirit, Willow Bunch, Lake of the Rivers, Twelve Mile, Eagle, Jackfish and Murray, Ponass, Muddy, Shallow, Goose and Cypress. Thus the twelve original sanctuaries and the twelve public shooting grounds reserved most of the large lakes in the southern part of Saskatchewan for wildlife at this early date.



Pied-billed Grebe is one of over 90 species recorded as breeding at the north end of Last Mountain Lake
G. Beyersbergen

After this impressive start time wore away at the sanctuaries. Drought made some of the land unsuitable for sanctuary purposes and Chaplin, Crane, Bigstick, Cabri and Whitebear were delisted in 1948 and were replaced by Val Marie and Duncairn Reservoirs and Murray, Scent Grass, and Upper Rousay Lakes. By 1956 Quill and Manito Lake sanctuaries were also delisted and were replaced by Neely and Opuntia Lakes, and Wascana.

Perhaps the most devastating blow to the sanctuaries was the loss of upland habitat surrounding all the lakes reducing the sanctuaries to water levels from day to day and to the islands. Only at Last Mountain Lake was the adjacent upland retained. Some 66,000 acres of land included in the sanc-

tuaries in 1925 was reduced to less than 4000 acres by 1956! Agriculturalists, concerned over the need for more pasture land, over the unsupervised use of reserve areas in which the no-trespass rule was not enforced and over the infestation of such areas by weeds put pressure on the authorities to begin the process of removing the upland habitats from the sanctuaries. In 1951 the Public Shooting Grounds were abolished at the request of agriculture.

Despite the great set backs to the prairie sanctuaries, the sanctuary idea took hold across Canada. Today there are over 80 sanctuaries, from the Atlantic to the Pacific and north into the Arctic Islands, administered by the Canadian Wildlife Service. It is an impressive list totalling over



Sandhill Cranes stage in impressive numbers at the north end of Last Mountain Lake along with the endangered Whooping Crane.
S. Woynarski

10.2 million hectares (25.2 million acres). They range from small islets only a few hectares in area up to Queen Maud Gulf Bird Sanctuary totalling 6.3 million hectares. There are 39 sanctuaries in Ontario, Quebec and the Maritime Provinces, 26 in the Prairie Provinces and British Columbia, and 16 in the Northwest Territories.

The concept of federal wildlife lands came-of-age in 1973 with the passage of the Canada Wildlife Act. This legislation permits the Canadian Wildlife Service to preserve and maintain important or unique lands acquired for wildlife, especially migratory birds, and rare and endangered species, across Canada. Today more than 40 National Wildlife Areas have been established, including seven in Saskatchewan. Last Mountain Lake is the eighth area and is currently managed in cooperation with the province. Negotiations are underway to establish it formally as a National Wildlife Area.

National Wildlife Areas are a place for wildlife. They exist in every province except

Newfoundland and Prince Edward Island. Several are being considered for the Northwest Territories and the Yukon. One such area in the Northwest Territories would protect Polar Bear Pass, a unique high arctic oasis on Bathurst Island. Sizes vary, but each wildlife area has a special significance for some form of wildlife: Cap Tourmente National Wildlife Area in eastern Quebec contains the mud flats that attract the world's only flock of Greater Snow Geese in the spring and fall; Vaseux-Bighorn National Wildlife Area in British Columbia's Okanagan valley not only includes part of Canada's only desert, but a crucial wintering range for the endangered California Bighorn Sheep; the Mary's Point section of Shepody National Wildlife Area, at the eastern end of the Bay of Fundy in New Brunswick, protects the mud flats and gravel beaches where hundreds of thousands of shorebirds rest and feed on their southward migration; Long Point National Wildlife Area in southern Ontario is the most extensive example of sand dunes and native vegetation in natural condition

around the Great Lakes. Some plants and wildlife in its teeming marshes are more typical of the Carolinas than of Canada and Last Mountain Lake attracts thousands of migrating ducks, Sandhill Cranes and geese, as well as the endangered Whooping Cranes. Each area is a home for many creatures drawn by some special combination of topography, soil, vegetation and water.

National Wildlife Areas while established and managed to protect wildlife are also places for people. The management programs for an area consider how both wildlife and people can use the area without disrupting the habitat and disturbing the wildlife.

In most areas, hunting, hiking, photography, fishing, birdwatching, snowshoeing and canoeing are permitted. Trails and viewing stands help visitors understand their surroundings and the wildlife, and the relationships between them. But where the habitat is particularly fragile, even hiking is limited. Wildlife areas provide opportunities to see wildlife in a natural setting, to experience a spectacle such as massive flocks of Canvasback and Redhead ducks migrating through St. Clair and Long Point National Wildlife Areas in Ontario. They offer the chance to learn about and appreciate wildlife habitats and to re-establish our ties with nature.

The Migratory Bird Sanctuaries across Canada also protect a wide array of species during breeding, migration and wintering periods. They include the breeding grounds of Atlantic Puffins, Northern Gannets, Ivory Gulls, Snow and Ross' Geese, Tundra Swans, White Pelicans to name a few; migration staging areas in the prairies, and the coasts for arctic geese, Whooping Cranes, shorebirds plus a host of other birds; and the wintering quarters for shorebirds and waterfowl in British Columbia and the Maritimes.

Many of the sanctuaries offer excellent opportunities for viewing migratory birds and other wildlife, while still respecting the

original purpose of protection for the birds.³

Celebrations to commemorate Canada's first Migratory Bird Sanctuary are planned by the Canadian Wildlife Service, the Province of Saskatchewan and public interest groups. Participation by the Saskatchewan Natural History Society and others will play a vital role in ensuring success of the centennial in 1987. It will be an opportunity for us as Canadians to appreciate the foresight shown by Sir John A. MacDonald, Thomas White, Edgar Dewdney and many others in protecting the first area for wildlife in Canada and to rededicate our efforts to protect Canada's wildlife heritage through the next 100 years.

¹ ANWEILER, G.G. 1970. The birds of the Last Mountain Lake Wildlife Area, Saskatchewan. *Blue Jay* 28:74-83.

² CANADIAN WILDLIFE SERVICE. 1980. Bird checklist, Last Mountain Lake Wildlife Management Unit. Canadian Wildlife Service Publ.

³ FINALY, J.C. 1984. A bird-finding guide to Canada. Hurtig Publishers, Edmonton.

⁴ FOSTER, J. 1978. Working for Wildlife; the Beginning of Preservation in Canada. University of Toronto Press, Toronto.

⁵ HATFIELD, J.P., 1965. Last Mountain Lake Bird Sanctuary and vicinity, Saskatchewan. Natural History Notes. Canadian Wildlife Service Publ.

⁶ HEWITT, G. 1921. The conservation of the wildlife of Canada. Scribners, New York.

⁷ LIVINGSTON, J.A. 1965. The cranes at Last Mountain Lake, pp. 371-377 in *The bird watcher's America*. Ed. O.S. PETTIGILL, McGraw-Hill, New York.

⁸ MURRAY, L.H. 1966. Bird sanctuaries in Saskatchewan, 1887-1965. *Blue Jay* 24:110-120.

⁹ PROUDFOOT, D. 1979. Fixed assets. *Nature Canada* 8(3):12-19.

¹⁰ THOMPSON, D. 1979. Secret wildlife areas. *Outdoor Canada*, May Issue: 29-32.

NATURAL AREAS AND SITES OF CANADIAN SIGNIFICANCE IN SASKATCHEWAN.

CLAUDE MONDOR, Head, Area Identification Branch, National Parks Branch, 10 Wellington Street, Ottawa, Ontario. K1A 1G2

During the past decade Parks Canada has conducted studies across Canada to identify natural areas that are of national importance. Although some of these areas have since been designated as national parks, provincial parks or equivalent reserves, and others may be protected in the future, many will remain without adequate conservation measures in place. However, by informing the public of the importance of these areas, as well as those that are responsible for their management, it is hoped that proper stewardship of the areas' resources will continue.

A number of nationally significant areas and sites have been identified in Saskatchewan during the conduct of Parks Canada's studies. This article summarizes these studies, the two types of nationally significant natural properties that Parks Canada is concerned with and presents a brief description of those areas in the province that have been identified to date. It is important for the reader to note that this list is incomplete and that no account has been taken of the areas' protective status.

Identifying Canada's Natural Heritage

The National Parks Branch, which is the agency in Parks Canada responsible for the establishment of new national parks and Canadian landmarks, has developed two methods for identifying natural properties of Canadian significance. These two methods are: (1) natural region studies; and, (2) natural theme studies.

Before the natural region study method is described, however, it is appropriate to outline the basis for planning the system of national parks in Canada. Since one of the

fundamental objectives of national parks is to protect outstanding examples of Canada's natural heritage, it follows that they should be identified, studied and understood in the context of the country's natural history. Consequently, Parks Canada adopted the "natural region concept" for planning its network of national parks in the early 1970's.

This approach entailed dividing Canada into appropriate geographical units for conservation purposes. The thirty-nine natural regions which resulted from this exercise are described in the *National Parks System Planning Manual* and are illustrated on Map 1. Each natural region has a distinctive character which is determined by its unique combination of natural themes (climate, geology, landforms, vegetation and wildlife). Parks Canada's long-term goal is to ensure the protection of an outstanding example of each natural region in the national park system. Parts of five natural regions are found in Saskatchewan: the Southern Boreal Plains (Region 12); the Prairie Grasslands (Region 13); the Manitoba Lowlands (Region 14); the North-western Boreal Uplands (Region 17); and, the Central Boreal Uplands (Region 18).

Natural region studies, or "regional analysis" as they are also referred to, involve three steps. The first step is to determine the unique combination of climate, geology, landforms, plant and animal life that gives the natural region its distinctive individuality. The second step is to identify areas throughout the region that are in a relatively natural state and which include the diversity of the region's natural features.



Grasslands Park area

G.W. Seib



Battle Creek, Cypress Hills

E. McGregor

And finally, each of the areas identified in the previous step are then ranked in terms of the extent to which they are representative of the natural region under study. The most representative of these areas are referred to as "natural areas of Canadian significance", or by the acronym "NACS". Potential national parks are selected from among this group of natural areas according to the criteria for new national parks listed in the *Parks Canada Policy*.

Natural Theme Studies, on the other hand, are concerned with identifying the occurrence of a specific natural feature or phenomena throughout the country and assessing whether each site is of local, provincial or national significance according to a preconceived rating scheme. Sites of national importance are those which include features that are either rare (occur infrequently or are very few in Canada), unique (the only known example in Canada), or exceptional (considered by the scientific community as an outstanding or "classic" example of the natural feature under study). These properties are termed "natural sites of Canadian significance", or "NSCS". Natural sites of Canadian significance will be eligible for designation under the Canadian Landmarks program when it is approved by the federal, provincial and territorial governments.

NACS in Saskatchewan

Natural region studies have been conducted of all the natural regions that cover Saskatchewan with the exception of Natural Region 12 - the Southern Boreal Plains. Only a very general assessment of the degree to which the three existing national parks - Riding Mountain, Prince Albert and Elk Island - are representative of the Southern Boreal Plains has been conducted to date.

These studies have identified three areas that satisfy the above description of a natural area of Canadian significance: (1) the Churchill River; (2) Prince Albert National Park; and (3) the Val Marie - Killdeer area. The location of these areas is plotted on Map 2 and a short description of each follows.

Churchill River - The chain of interconnected lakes which are collectively called the "Churchill River" has been a place of unique value and inspiration for the Woodland Cree Indians during historic times, the voyageur and explorers of the Fur Trade and, more recently, for those that have canoed it.

Here, one can experience the elements that are typical of the "Canadian Shield", as the Central Boreal Uplands (Region 18) is commonly called. It is a landscape of glacial scoured Precambrian bedrock; boreal forest stands of Black Spruce, White Spruce, Balsam Fir and Jack Pine interspersed with shallow swamps and muskeg; lakes interconnected in a disorderly fashion by fast flowing streams; Moose, Woodland Caribou, Beaver, bear, Lynx, wolves, pickerel, mosquitoes and hordes of blackflies.

The Churchill is considered by many as "...one of the best canoe rivers" in Canada, altered in a few places but essentially unchanged throughout its length from Ile-a-la-Crosse to Frog Portage.

Prince Albert National Park - Prince Albert National Park is an outstanding example of the Southern Boreal Plains (Region 14), a region which is characterized by elements that are borrowed from the Prairie Grasslands to the south and the Canadian Shield to the north.

The Park's wildlife, for example, includes such prairie species as ground squirrels, Badger and Coyote, in addition to Moose, wolf, Lynx, caribou and Osprey that inhabit the northerly Shield country. It also includes one of Canada's largest colonies of the increasingly rare white pelican. The Park's vegetation also illustrates the region's transitional nature varying from aspen forest along its southern boundary, with an occasional patch of fescue grassland, to boreal forest in the northern limits.

CANADA



NATIONAL PARK NATURAL REGIONS

Map 1

WESTERN MOUNTAINS

1. Pacific Coast Mountains
2. Strait of Georgia Lowlands
3. Interior Dry Plateau
4. Columbia Mountains
5. Rocky Mountains
6. Northern Coast Mountains
7. Northern Interior Plateaux and Mountains
8. Mackenzie Mountains
9. Northern Yukon Region

INTERIOR PLAINS

10. Mackenzie Delta
11. Northern Boreal Plains
12. Southern Boreal Plains and Plateaux
13. Prairie Grasslands
14. Manitoba Lowlands

CANADIAN SHIELD

15. Tundra Hills
16. Central Tundra Region
17. Northwestern Boreal Uplands
18. Central Boreal Uplands
19. (a) West Great Lakes - St. Lawrence Precambrian Region
- (b) Central Great Lakes - St. Lawrence Precambrian Region
- (c) East Great Lakes - St. Lawrence Precambrian Region
20. Laurentian Boreal Highlands
21. East Coast Boreal Region
22. Boreal Lake Plateau
23. Whale River Region
24. Northern Labrador Mountains
25. Ungava Tundra Plateau
26. Northern Davis Region

HUDSON BAY LOWLANDS

27. Hudson-James Lowlands
28. Southampton Plain

ST. LAWRENCE LOWLANDS

- 29 (a) West St. Lawrence Lowland
- (b) Central St. Lawrence Lowland
- (c) East St. Lawrence Lowland

APPALACHIAN

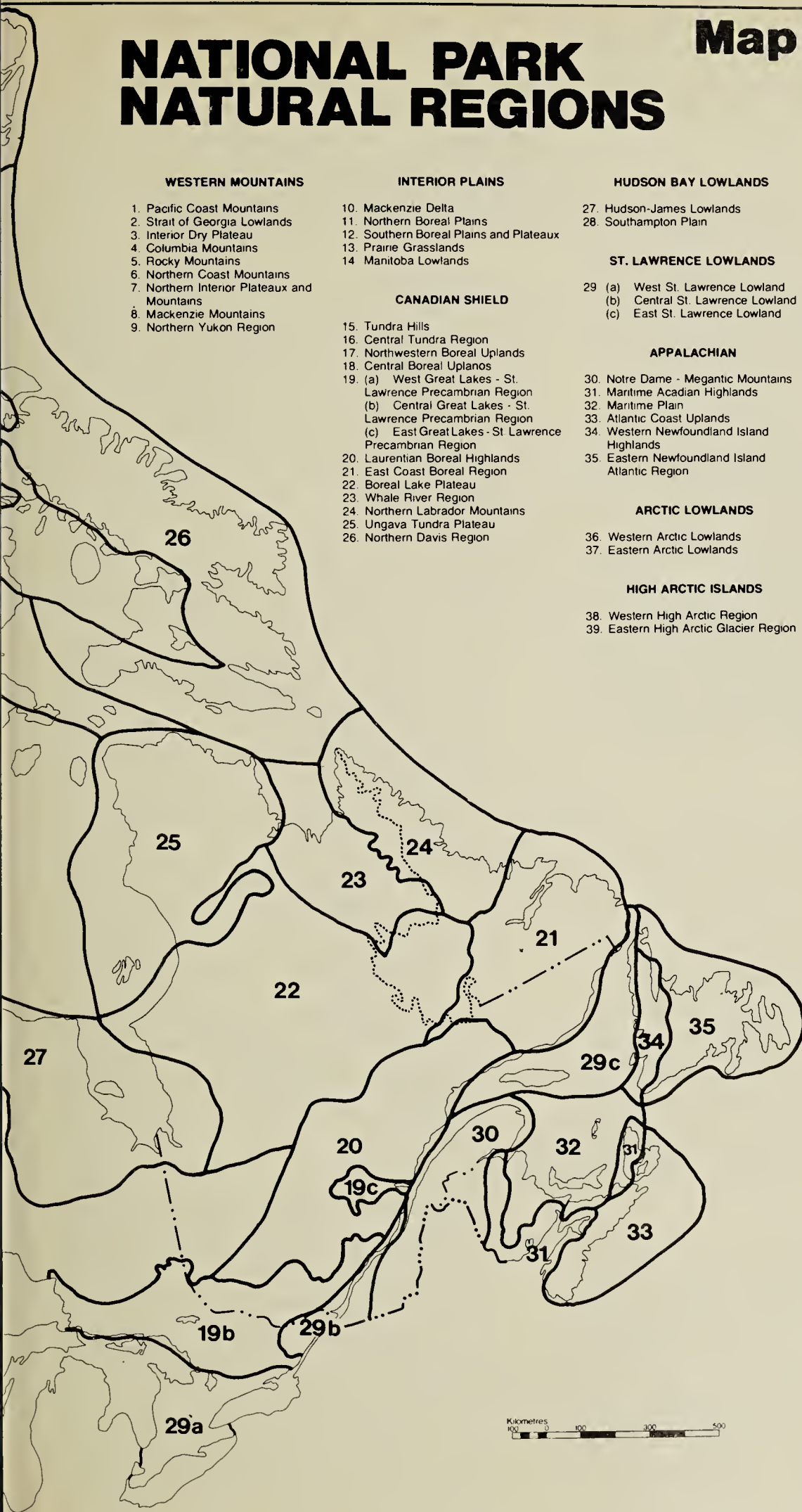
30. Notre Dame - Megantic Mountains
31. Maritime Acadian Highlands
32. Maritime Plain
33. Atlantic Coast Uplands
34. Western Newfoundland Island Highlands
35. Eastern Newfoundland Island Atlantic Region

ARCTIC LOWLANDS

36. Western Arctic Lowlands
37. Eastern Arctic Lowlands

HIGH ARCTIC ISLANDS

38. Western High Arctic Region
39. Eastern High Arctic Glacier Region



Kilometres
100 0 100 200 300 400 500

It was on the shore of Ajawaan Lake, located in the northern half of the Park, that Grey Owl, the colorful, controversial naturalist, author and orator spent many years.

Val Marie-Killdeer - This natural area of Canadian significance is one of the latest additions to the national park system, thanks to 20 years of efforts of the Saskatchewan Natural History Society to have a sizeable example of natural grassland in Canada protected.

In addition to the mixed prairie vegetation there exists a nearly complete sample of prairie fauna. Species ranging from the more common antelope and Richardson's Ground Squirrel or "gopher", to the rare and endangered Prairie Falcon, Ferruginous Hawk and Sage Grouse can be observed here. The Black-tailed Prairie Dog also resides within the proposed boundaries of this newly created park, the only place in Canada where this rodent occurs in its natural habitat.

The bizarre shaped landforms of the Killdeer Badlands, which comprise the eastern component of Grasslands National Park, are not only of scenic interest to visitors, but are also a natural monument in the growth of the paleontological sciences in Canada. It was here where Sir George Mercer Dawson made the first recorded discovery of dinosaur remains while serving as geologist and naturalist to Her Majesty's North American Boundary Commission in 1874.

NSCS in Saskatchewan

As the Canadian landmarks program is not yet operational only a few natural theme studies have been undertaken by Parks Canada over the past decade. The five natural sites of Canadian significance that have been identified in Saskatchewan as a result of these studies should also be considered as "preliminary" in the sense that criteria for the selection of this category of nationally significant property have not

been finalized with the provincial and territorial governments. It is also important for the reader to take note that no comprehensive provincial inventory of sites that encompass a natural feature or phenomenon which is unique or rare in Canada or the world has been completed yet. Consequently, many more sites await discovery.

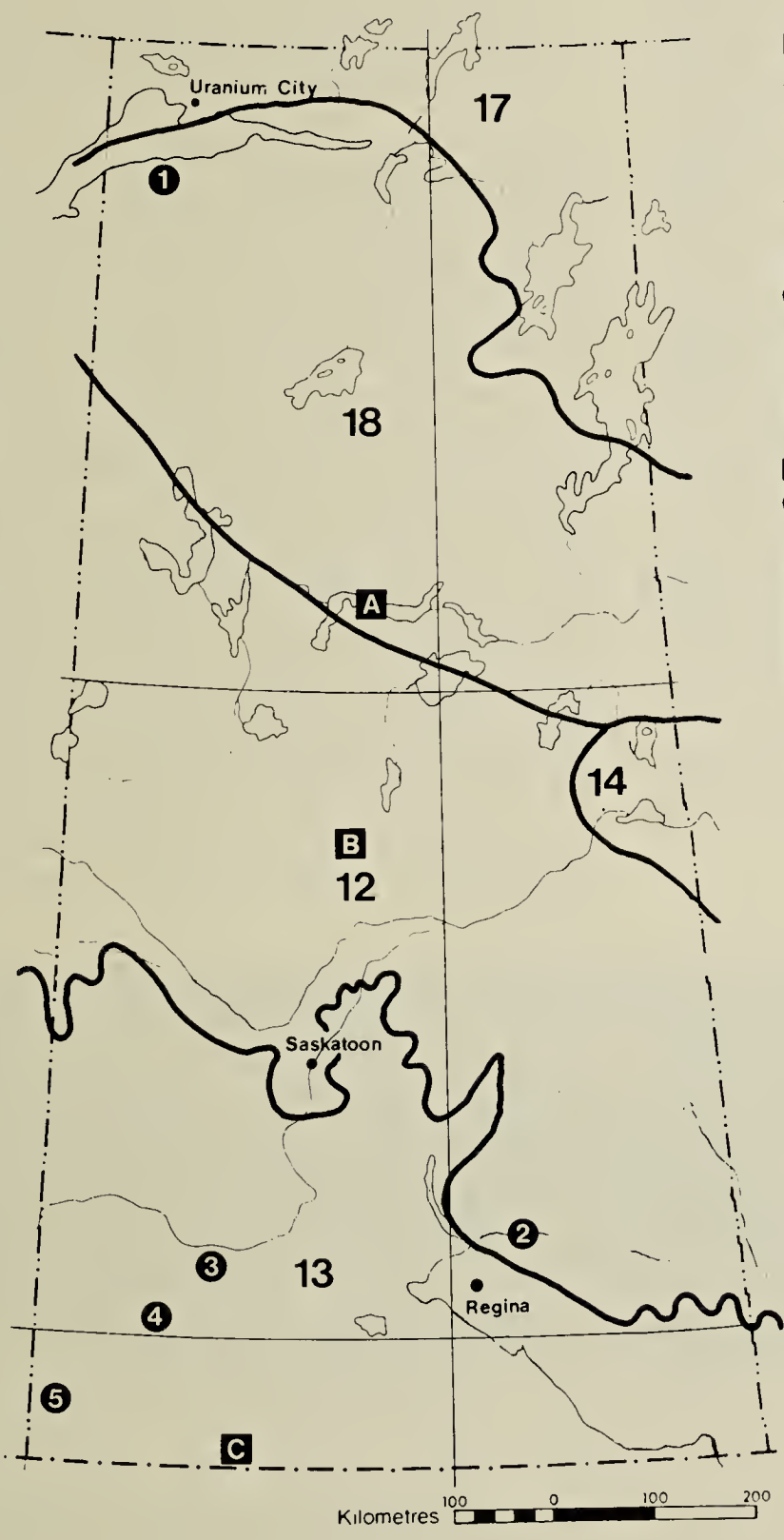
The natural sites of Canadian significance identified to date in Saskatchewan include: (1) the Athabasca Sand Dunes, (2) the Qu'Appelle Valley, (3) the Matador Site, (4) the Great Sand Hills, and (5) the Cypress Hills. Their approximate location is shown on Map 2 and a summary statement of their significant attributes are listed below.

Athabasca Sand Dunes - The Athabasca Sand Dunes, which extend from Ennuyeuse Creek to the MacFarlane River on the south side of Lake Athabasca in northwestern Saskatchewan, are the largest, single, uninterrupted active sand dune occurrence in Canada. The active dune system consists of complexes of sand dune ranging from ridges up to 35 m high not stabilized by vegetation to low dunes thinly covered by grasses and shrubs. In places sand dunes move across partially stabilized gravel pavements and exposed water tables or they form unstable sheets of loose sand.

This site is also recognized by botanists as an important centre of endemic plant species in Canada where a number of unique taxa have evolved in post-glacial times.

Qu'Appelle Valley Spillway - The Qu'Appelle Spillway is the longest, widest, and deepest of glacial spillways in the Prairie Provinces and Canada. The Qu'Appelle was formed approximately 14,000 years ago as overflow from glacial lake Regina and meltwater from the retreating ice sheet carved a valley to a depth of 180 m and with a valley bottom up to 1.6 km wide. It is regarded by many geologists as a "classic" example of the meltwater channel and spillway landforms.

SASKATCHEWAN



NATURAL REGIONS

- 12 Southern Boreal Plains
- 13 Prairie Grasslands
- 14 Manitoba Lowlands
- 17 Northwestern Boreal Uplands
- 18 Central Boreal Uplands

NATURAL AREAS OF CANADIAN SIGNIFICANCE

- A** Churchill River
- B** Prince Albert National Park
- C** Grasslands National Park

NATURAL SITES OF CANADIAN SIGNIFICANCE

- 1** Athabasca Sand Dunes
- 2** Qu'Appelle Valley Spillway
- 3** Matador
- 4** Great Sand Hills
- 5** Cypress Hills

Matador Grasslands - Most of this site is a grassland dominated by Northern Wheatgrass and June grass, one of the five major types of Mixed Prairie. This type of grassland formerly occupied areas of lacustrine clay soils, which because of their high moisture holding capacity, are considered very suitable for tillage. The Matador site is the largest remnant of this grassland type in Canada and is of international significance as a grassland research centre under the auspices of the International Biological Program.

Great Sand Hills - The Great Sand Hills, located approximately 70 km west of Swift Current are second in size to the Athabasca Dunes mentioned previously. The site includes a great variety of dune forms with blowouts and parabola dune forms being the most common. Other forms consist of circular, V- and U-shaped, shield, ridge-sided, fish-hook dunes and elongated sand ridges and border ridges. This sand dune occurrence is considered by some to be the most beautiful of all sand dunes sites known in Canada. It is also the best example of sandhill vegetation in the Prairie Grasslands.

Cypress Hills - To the Cree Indians the Cypress Hills were known as the "Mun-a-tuh-gow", which means the "Beautiful Highlands". This site encompasses a variety of geological, botanical and wildlife features that are rare or unique in Canada, and as such is of exceptional value and interest for the scientist and

recreationist alike. It is, for example, one of the few areas in Canada that was unglaciated during the last continental glaciation. It is also a centre of rarity from a botanical perspective in that it represents an outlier containing numerous cordilleran, eastern arctic and northern boreal species. The faunal features of the Cypress Hills are similarly diverse and include an endemic snail and the rare and endangered Trumpeter Swan.

Concluding Remarks

In this article, I have presented a thumbnail sketch of how Parks Canada identifies natural areas and sites of Canadian significance and listed those areas within Saskatchewan which have been identified to date. Because the inventory is incomplete, readers are encouraged to submit any sites which, in their opinion, appear to satisfy the criteria for a natural area or natural site of Canadian significance. Suggestions should clearly identify the site's location, why that area is nationally important, and its current protective status. All suggestions should be forwarded to the following address: **Chief, National Parks System Division, National Parks Branch, 10 Wellington Street, Ottawa, Ontario. K1A 1G2**

As the management of these properties is a provincial responsibility, a copy of the suggestions(s) should also be forwarded to the attention of **Director, Parks Branch, Department of Tourism and Renewable Resources, Legislative Building, Regina, Saskatchewan. S4S 0B3.**

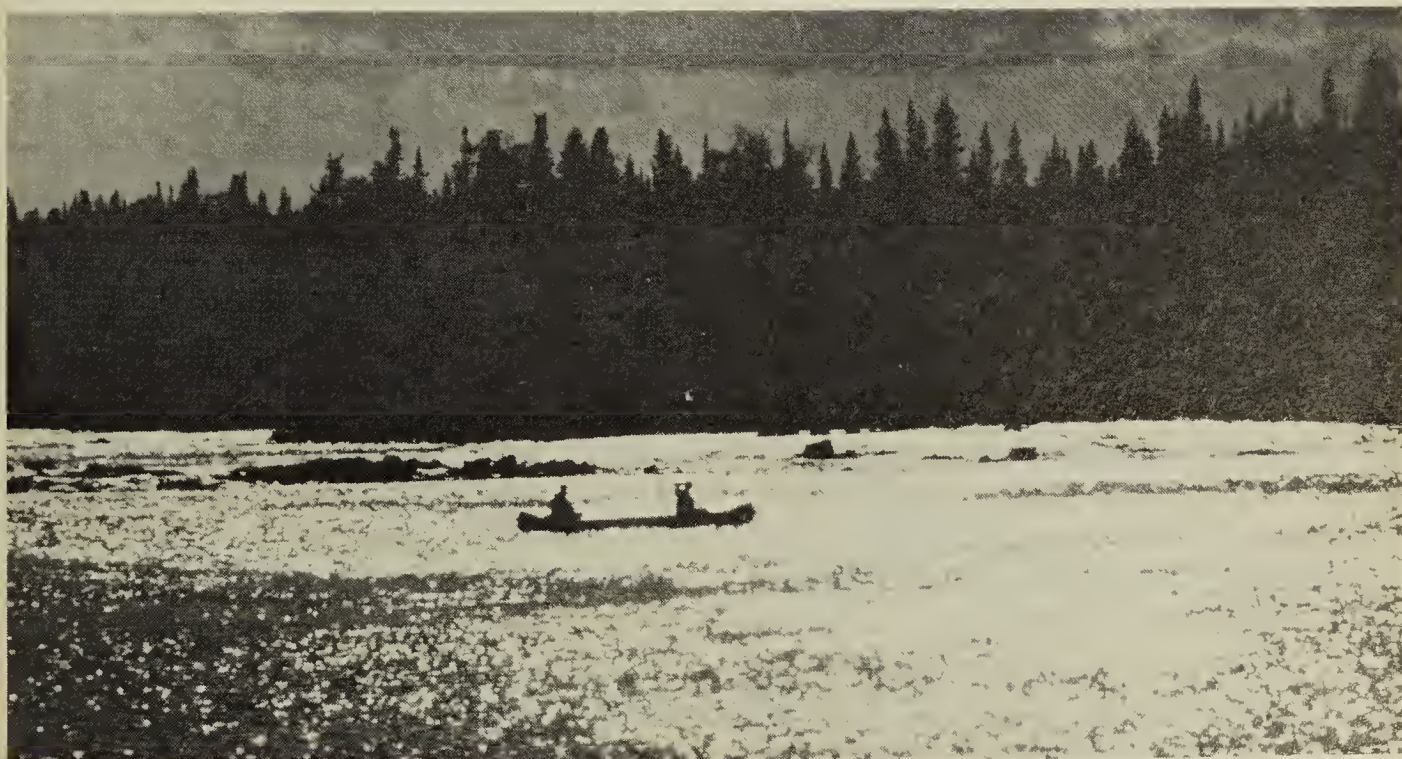
CLEARWATER HERITAGE

TIM E.H. JONES, Box 101, Dalmeny, Saskatchewan, S0K 1E0 and HENRY T. EPP, 714 Delaronde Crescent, Saskatoon, Saskatchewan. S7J 3Z8

The Clearwater River arises in the Northern Coniferous Forest vegetation region of the Precambrian Shield, about halfway between Athabasca and Peter Pond lakes in northwestern Saskatchewan. It flows southeast for about half of its 280 kilometer course through Saskatchewan, but then turns abruptly southwest near Careen Lake and enters the Athabasca River at Fort McMurray in Alberta, and its waters eventually reach the great MacKenzie River and Arctic Ocean.

As its name (correctly) implies, it is an increasingly rare phenomenon in the modern world, a very clear stream. Its character and environs vary considerably, depending on the underlying geology, as it flows through three zones of distinctively different bedrock:

Precambrian granites and sandstones, and Devonian limestones. The nature and erosional resistance of the geology, the presence of local topographic relief of some 200 m and a vertical drop of over 150 m as the river flows from its Broach Lake headwaters to the Athabasca combine to give an outstanding and, at times, spectacular canoeing experience, as the river flows over rocky ledges, boulder-strewn rapids or through quiet, meandering stretches. There are a number of land-form features which make travelling on the Clearwater a most attractive nature experience, including small gorges, waterfalls, sinkholes, a very deep glacial meltwater channel, a major ice-recession moraine, sandbars, outwash plains, eskers, drumlins and kames.



Canoeists below rapids.

R. Johnson and B. Weichel



*Un-named limestone gorge. R. Johnson
and B. Weichel*

The mantle of vegetation reflects this geomorphological variety. Both the chemical nature of the soils and the micro-climates created by the dissected topography within the subarctic climate are responsible for the rather unusual latitudinal occurrence and mixtures of arctic-subarctic and more "southerly" plants. For example, small, grassy areas are found on the south-facing slopes of the deep glacial valley in the vicinity of Methy Portage, and large stands of White Spruce and Balsam Fir are found at the northern extension of their range, in the valley. A number of rare species are known as well, although the flora of the Clearwater has not yet been fully studied. Consequently, the lower Clearwater valley in Saskatchewan, especially, is a prime natural area, an example of considerable ecological variety within a relatively small space.

The fauna also has not been fully studied, although the usual northern boreal forest mammals like moose, bear, woodland caribou and smaller fur-bearers like wolverine, mink, muskrat and beaver are known. The Clearwater is one of the world's best grayling habitats, and whitefish, pickerel and northern pike swim in the river and its tributaries like the Virgin, Mirror and Deschambeau.⁷ The birds are not described in detail yet either, but we suspect that the varied micro-habitats have attracted a rather unique mixture of types of birds.

While the Clearwater's natural attributes are now coming to be better known,⁵ our current knowledge of its human history, while even less complete, suggests that it is of not only provincial, but national and perhaps even international interest. It is a fact that most of the human uses of this landscape in prehistoric times and the last two hundred and ten years or so of the historic period have left few tangible traces, and that *archaeological* studies must therefore be undertaken to unearth evidence of human land use and the prehistoric patterns of settlement and resource exploitation. This was done on the Churchill River for the first time in the early 1970's, but such systematic surveys and excavations have yet to be done on the Clearwater. The scant current evidence from isolated finds suggests human presence here up to about 2,000 - 5,000 years ago. However, there are at least two historical features in the area of obvious interest and significance. Between Lloyd and Carleen Lakes are found three small and quite time-worn rock painting sites near the northwestern periphery of the Canadian Shield rock painting style area. The well known Methy Portage, between the Clearwater River (Arctic watershed) and Lac La Loche (Hudson Bay watershed), was a crucial link for the fur traders of eastern Canada to the northwestern fur hinterland, and for the European exploitation of northwestern America.⁵

To date, it is mostly a small number of white-water canoeists who have experienced in person the natural and historical attractions of the Clearwater River itself, and a few more who have hiked the 19 kilometer long Methy Portage from Lac La Loche to the Clearwater. This is, to date, truly a wilderness area since easy access is limited to a bridge at Warner Rapids on the Cluff Lake Road.

Readers of this journal may be familiar with our late 1960's proposal to protect the Methy Portage as a very important historical and natural area, and will recall the resolution by the S.N.H.S. at past annual meetings supporting that idea.² Some recent initiatives by the provincial government, in cooperation with Parks Canada, give encouragement that protection and enhanced enjoyment of both the River and Portage may yet become realities.

In June, 1984, the Clearwater was nominated by Saskatchewan Parks and Renewable Resources for designation as a Canadian Heritage River. The Canadian Heritage Rivers System (C.H.R.S.) is managed by a Board made up of provincial, territorial and Parks Canada representatives. It is designed "to give national recognition to the important rivers of Canada and to ensure long-term management which will conserve their natural, historical and recreational values for the benefit and enjoyment of Canadians now and in the future." The Clearwater is the first river nominated by Saskatchewan, and one of the first four nominated by the provinces. Before C.H.R.S. status is granted, master management plans must be prepared, and Saskatchewan Parks and Renewable Resources has just received a proposed plan from consultants contracted to prepare it.^{3 4} The next step is to circulate the plan for public reaction and comment before officially designating the river, establishing land-use boundaries for a wilderness park and setting any other types of protective restrictions. (One

possibility is naming Methy Portage a World Heritage Site under UNESCO auspices).

These are extremely encouraging developments to all lovers of wilderness, but of course in themselves they will not ensure that we and future generations will continue to enjoy such an unaltered landscape, either in person or in spirit. What will undoubtedly occur with the more official designation and recognition of the Clearwater area is increased interest in visiting it, and more pressure for better access in the form of roads. Therefore, the determination of desirable and undesirable forms of recreational activities and the various types of protection of sites and resources will be necessary. Here again is where the opinions of S.N.H.S. members will continue to be all important. Conversely, designation will have to include funded support for research to fill the many information gaps concerning the cultural and natural heritage of the area, and it should also provide some ways and means for the local Chipewyan residents to culturally and materially benefit from sensible, sensitive development of interpretation and other services.

The inauguration of the long-awaited C.H.R.S. program in Saskatchewan is potentially a giant step forward in heritage development, and it will undoubtedly stimulate the conservation of other, equally important locales. In this context, the 1978 recommendations of the Churchill River Board of Inquiry are worth remembering and repeating. The Board recommended that a "Churchill Heritage Waterway" be "preserved as a heritage for present and future generations", that a Waterway Commission to "establish appropriate corridor boundaries and administrative arrangements" be set up, and that local people should participate in the management of the Waterway. This Churchill Heritage Waterway would encompass the Churchill, Sturgeon-Weir and Clearwater River



The Clearwater Valley in morning fog, near the Alberta-Saskatchewan border

R. Johnson and B. Weichel

systems in a protected corridor not less than 32 kilometers across.¹

The Churchill River Board of Inquiry carried out an exhaustive analysis of preservation versus hydro-electric development issues and held full public hearings on those issues. The overwhelming consensus was (and remains) that treasures like these major northern rivers are worth protecting and must be protected as part of our irreplaceable and irreducible natural and cultural heritage. The C.H.R.S. status for the Clearwater is, therefore, a good first step for Saskatchewan - but should not be the last.

¹ CHURCHILL RIVER BOARD OF INQUIRY 1978 Report. Presented to Saskatchewan Minister of the Environment. June, 267 pp.

² EPP, H.T. AND T. JONES 1969 The Methy Portage - Proposal for a Saskatchewan Historic and Nature Trail. *The Blue Jay* 27(2):101-107.

³ HILDERMAN, WITTY, CROSBY, HANNA and ASSOCIATES 1985a Clearwater River Management Plan Background Report. March, 94 pp., appendices and maps. Submitted to Parks and Lands Branch, Saskatchewan Parks and Renewable Resources.

⁴ HILDERMAN, WITTY, CROSBY, HANNA and ASSOCIATES 1985b Clearwater River Management Plan. March, 61 pp. and maps.

⁵ JOHNSON, R.H. and B.J. WEICHEL 1982 Clearwater River Saskatchewan: Analysis of Canadian Heritage River and Wilderness Park Potential - Broach Lake to Alberta Border. March 62, pp. and appendices. A Pilot Study Conducted for Agreements for Recreation and Conservation (ARC) Branch, Parks Canada, and Program Planning Branch, Tourism and Renewable Resources, Saskatchewan.

⁶ MACKINNON, C.S. 1980 Some Logistics of Portage La Loche (Methy). *Prairie Forum* 5(1):51-65

⁷ NATIONAL AND PROVINCIAL PARKS ASSOCIATION OF CANADA 1984 The Clearwater River - Saskatchewan. *Park News* 20(3):19-22.

SPIRIT VOICES

*Legend has it, spirit voices
called to men in days of yore
as they paddled in the twilight
or camped upon the shore.
For they lived quite close to nature
understood its ways
and answered back those voices with
"Who calls?, Who calls, to me?"*

*T'is no legend, I assure you
For those voices call to-day
but we have no time to hear them
as we hurry on our way.
Wrecking havoc in the Valley
denuding hill and vale.
Till the Spirits cry in anguish
"Who cares?, Who cares, for me?"*

*I hear those spirit voices
in the stillness of the night
as I tread along the hilltops
in the moonbeams, eerie light.
I hear those spirit voices
they won't let my heart be free,
Till I answer back those voices
"I care, I care, for Thee".*

- Lorne Rowell, Box 639, Fort Qu'Appelle, Saskatchewan. S0G 1S0



Round Lake, Qu'Appelle Valley

Lorne Scott

HERBICIDE USE IN SASKATCHEWAN FORESTS: A MATTER OF VALUES*

J. STAN ROWE, Department of Crop Science and Plant Ecology, University of Saskatchewan, Saskatoon, Saskatchewan. S7N 0W0

The intent of this brief is to get at the roots of some of the problems facing the Task Force, thereby bringing to the inevitable debate a better understanding of what motivates the opposing views. Consequently, the contents of this brief do not in all parts conform to the Terms of Reference of the Task Force, although they are relevant to the latter. In his news release of December 10, 1984, the then Minister of Parks and Renewable Resources stated that the Task Force report will shape government policy on the herbicide/forestry issue, which justifies the adoption here of a broad rather than a narrow perspective. I also argue against the use of herbicides as a forestry management tool.

Facts and Values

In all questions of individual and social action, values (whether expressed or not) set the direction. In those social circumstances where a consensus on action is speedily reached by agreement on facts, a parallel consensus in value judgments can be assumed. By the same token, strong differences of opinion as to appropriate action reflect conflicts in basic values that are commonly described as differences in philosophy, ideology, worldview, or paradigm. In such circumstances facts lose their significance as a means of reaching consensus, for the opposing sides sift, select, edit and marshal facts according to their congruity with whichever worldview or philosophy is held.

Our education system is remiss, or perhaps in a multicultural world we should label it naive, in not teaching that facts are secondary to deep beliefs. Facts are the dummy on the knee of the ventriloquist, saying what he wants them to. It is *the interpretation* of facts that is important, and in science as much as in politics, law, or commerce, meaning depends on a value framework. In common parlance, the Devil can also quote scripture.

Every Task Force and Board of Inquiry looking into environmental questions comes up against the tough truth that today two value systems are in conflict. For lack of better terms I will call them the *humanistic-technological* and the *ecologic-environmental*. The first, the philosophy or religion of the majority, has dominated the western world for 500 years since the Renaissance. Above all else it values human ingenuity as expressed in technological control and industrial growth. In essence and despite such flare-up warnings of limits to growth as acid rain, toxic pollution, soil erosion, and atmospheric change, it optimistically exempts humanity from ecological constraints. It believes that all problems can be overcome by more science and more technology of the power/control type.

The second view places high value on the world ecosystem as the one and only irreplaceable home of all life. Reemerging in

* This brief was prepared for presentation to a task force investigating the appropriateness and safety of herbicide use in forest management in Saskatchewan. The task force, chaired by Professor Don Rennie, Dean of Agriculture at the University of Saskatchewan, was approved by the Government of Saskatchewan in late 1984. The brief has been reproduced by the Saskatchewan Environmental Society as part of its "Backgrounder" series.

the second half of the 20th century, this philosophy stems from an ancient pre-industrial tradition with roots in many cultures of the world (including that of the Dene). It does not exempt humanity from the ecological necessities of fitting itself to the cycles and flows of this unique planet. Although it is not anti-science/technology, it recognizes the necessity of guiding science/technology toward world-preserving and life-enhancing goals rather than assuming, as today, that whatever the market rewards is benign. In all questions of social directions it asks: Which alternative is most likely to contribute over the long term to a healthy, sustainable symbiosis between the organic world and the human race?

I am not suggesting that citizens of Saskatchewan are neatly polarized in two camps, accepting the one value system or the other. Many, probably most, are somewhere in between, trying to make the best of both. Nevertheless an understanding that the two viewpoints exist, that they are based on different evaluations of the world, and that they call on their believers to act in quite different ways, helps to explain what is often attributed to "emotionalism" or "irrationality" on either side. It explains why economists and ecologists are frequently at odds, why nuclear energy is embraced with joy or rejected with loathing, and why northern people living in a largely "bush economy" perceive proposed actions coming out of southern industrial society as threatening to their way of life.

Herbicides and Vegetation Management

Because the emerging ecologic-environmental world-view seems to me to be the more realistic of the two so far as the future of humanity on this planet is concerned, my position is that *as a general rule* society ought to opt always for alternatives to the use of biocides in whatever management of organisms - plants or animals - is undertaken.

Biocides are designed to kill, and by their very nature they are unsafe. Biology has

revealed that DNA ties all living things together; many homologies are apparent in the cell constituents of plants, animals, and ourselves. The short histories of supposedly non-injurious poisons show their distressing capacity to affect more than their designated targets. Alachlor is a recent example, cast in doubt by new tests that indicate it may be carcinogenic. Ethylene dibromide is another, banned in 1983 in the USA after 40 years of "safe" use. As reported by the US National Academy of Sciences, approximately 80 percent of some 600 generic pesticides in use have not been adequately studied for their risks in producing cancer, genetic changes, or birth defects³ - presumably because such studies take a long time.

A second reason for avoiding toxins as tools for manipulating the ecosphere is the probability that even those pronounced safe (meaning staying and perishing with their targets) will act synergistically with other chemicals in the environment to produce unforeseen toxicities. Introducing new poisons into the chemical stew that already surrounds us risks multiplicative effects that are impossible to test for or predict; there are too many permutations and combinations. The mortality of trees in the Black Forest of Germany seems to be an as yet unexplained synergism between acid rain and other industrial toxins. No agency can possibly pre-test, for example, the effects of forest herbicides in combination with Alberta-released SO₂.

Roundup is reputed to be a relatively safe herbicide, although the fraudulent IBT tests, the secret Monsanto tests (proprietary and therefore not released), and at least one report of a suspected carcinogen associated with glyphosate,¹ raise legitimate doubts as to its side-effects. Also still unanswered are questions as to its effect on water bodies and on such hydrologically important communities as Sphagnum bogs and sedge fens.

Sutton's recent article on the use of glyphosate in Ontario under conditions similar to those in the Mixedwood forest of



Signal Point

Wapawekka Lake, Saskatchewan

Chris Adam

Saskatchewan makes the important point that "Success in controlling non-crop vegetation does not necessarily mean that crop trees will subsequently perform well."² Although competitors such as aspen were killed by glyphosate treatments, the opening of the vegetations invited rodent damage and bud-freezing of the white spruce seedlings. Neither did the herbicide treatments benefit jack pine seedlings. For a variety of reasons, too great a success in weed control can be detrimental to the supposed beneficiaries in the non-agricultural forestry setting.

The above is not meant to identify as a central issue the safety and efficacy of Roundup. If, as happened with 2, 4,5-T, Roundup were to be banned for whatever reason, Monsanto or Ciba-Geigy would soon have ready another candidate herbicide guaranteed to do the job swiftly, efficiently, and safely. The important question is not *which* poison, but *whether the biocide route is the way to go* in the an organic world already suffering from a surfeit of toxins? I believe that R & D money should resolutely be diverted to safer alternatives, and that the safety factor should always be a major weight in cost/benefit evaluations of plantation management.

Land Use and Forest Management Plans in Northern Saskatchewan

It is difficult if not impossible to find good

answers to questions of detail, especially technologic questions such as whether or not to use herbicides, when the larger picture and context of land use is unclear. The Task Force is addressing a small part of a large social problem having to do with rights to the use of the land, and with how forestry is to be integrated in a multiple land-use framework.

In south Saskatchewan a farmer owns his land and has the undisputed right to spray biocides around as he pleases. If he inadvertently poisons such non-target organisms as his family and himself, that is pretty much his affair (though the long-term social costs may be great). By contrast, the forested lands of the north are public (crown) lands, leased for forestry purposes but not owned by the forest industry. As custodian, the government must consider other claims on the land than those of the forest industry. Does herbicide spraying to release conifer seedlings fit into the larger picture of land uses that include along with recreation, tourism and wildlife management the so-called "bush economy" of fishing, hunting, trapping, and berry picking? In my view it does not.

The intention, in one report I have seen, is to treat with herbicides each year about one-fifth of the annual cut-over area. Such an on-going program would soon subject an appreciable area to the largely unfore-

seen consequences of depleting the broadleaf vegetation. The character of the forest will be changed in a patchwise fashion as non-seeding (vegetatively reproducing) species are killed, rare plants exterminated, and plants with early dormancy or other mechanisms of resistance are selected as weedy survivors. Will the replacement of aspen by willows be counted an advance? No one can say without invoking a land use plan that prescribes the full range of legitimate uses, nor can anyone say without thinking hard about the future (when aspen may be Saskatchewan's most valuable tree).

Within a broad land-use framework, forestry will continue to be an important part of the economy of the north and establishment of future forests after clear-cutting will continue to be the major management problem. Alternatives to chemical weeding may be found, in part, through silvicultural planning.

Foresters recommend prompt planting after logging, before strong competition develops. Use of large planting stock, and preparation of site by surface scarification, are techniques that assist the establishment and the competitiveness of planted seedlings. Of equal importance is the matching of species to site, for planting jack pine on clay-loam tills and other such aspen sites is simply to ask for competitive trouble. Use of a good site classification with soil maps that identify surficial materials by texture, drainage, and pH, can help to avoid off-site plantings.

Nevertheless, without fire that was the normal regenerator of Saskatchewan forests, problems of competition are unavoidable on the richer conifer sites, and here manual release is probably the only feasible alternative to the use of herbicides. The techniques are familiar to foresters and there are many good tools for the job. Just such a project is going on in the Hudson Bay forest district this winter, described as a Forestry Improvement Program in DPRR's News Release 85-022, 11 January 1985.

Arguments against manual cleaning of plantations are economic; the costs are said to be too high for the projected benefits. In such calculations much depends on the social and time frameworks within which the benefits are calculated. The benefits of preserving farmland against its alienation for other uses are low or high depending on whether the judgment is that of the individual with his eye on retirement or that of society with its eye on good food for the next ten, twenty or more generations. Similarly, in forestry are benefits to be judged in the narrow framework of fast, cheap wood growth or by reference to a broader and longer term range of environmental values? The social benefits of enlisting the people of the north as husbanders of the forest in ways of which they approve are incalculable, and hence do not fit the traditional cost/benefit calculations.

The people of northern Saskatchewan are in dire straits, with unemployment running at 60-80 percent. Many feel that as long as they have access to the natural forests they can survive economic hardships. Industrial forestry is perceived as a real threat to their livelihood. It is important that (1) they be sympathetic to forest management techniques and that (2) they benefit from use of the forest resource. On both counts the proposed use of herbicides should be rejected in favour of more environmentally benign and more labour intensive methods of forest management.

¹ KHAN, S. and J.C. YOUNG. N-nitrosamine formation in soil from the herbicide Glyphosate. *Journal of Agricultural Food Chemistry* 25(6):1430-1432.

² SUTTON, R.F. 1984. Plantation establishment in the Boreal Forest: Glyphosate, Hexazinone, and manual weed control. *Forestry Chronicle* 60:283-287.

³ WEIS, J.S. 1984. Pesticide policies change slowly. *BioScience* 34(9):549.

PEACH-LEAVED WILLOW IN EAST-CENTRAL SASKATCHEWAN

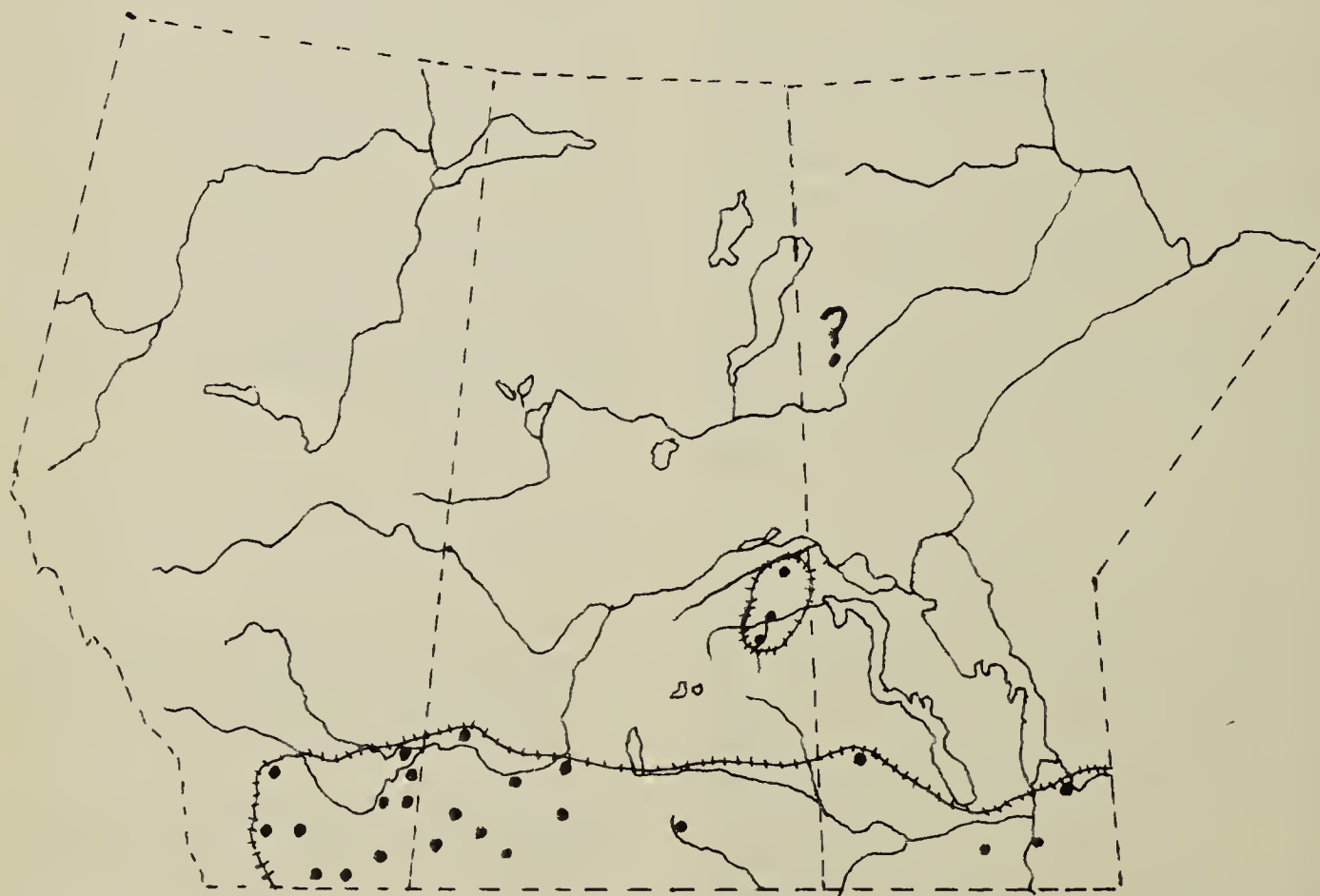
DONALD F. HOOPER, Box 40, Somme, Saskatchewan. S0E 1N0

There was an interesting, illustrated article by Don MacPhedran in the March 1983 *Blue Jay* about some introduced Peach-leaved Willow in the Prince Albert area.⁷ This article is about the native Peach-leaved Willow (*Salix amygdaloides*) in east-central Saskatchewan.

The Peach-leaved Willow was discovered at Hudson Bay and Bertwell, along the Red Deer and Etomami rivers by A.J. Breitung sometime before 1942.^{2 4} Since December 1983 I have sent 18 species of willow to the National Museum in Ottawa. They have been identified by the Canadian willow expert Dr. George W. Argus and one of the most interesting was *Salix amygdaloides*.

My first collection of the Peach-leaved Willow was from along the Etomami river 12.5 mi. south of Hudson Bay (Hooper & Baker 83071601, 16 July 1983). There were three clumps of young plants with stems 4 inches in diameter near the ground and about 20 feet tall. They were growing in rich river bottom soil, near the water, among Manitoba Maple (*Acer negundo*) and American Elm (*Ulmus americana*).

On 21 July 1984 we found the Peach-leaved Willow (Hooper, Baker & Harms 84072112) in a new locality 50 mi. north of Hudson Bay, near Bainbridge river and #9 highway. Here the Pasquia Hills drops abruptly to the Carrot River valley and the



PEACH-LEAVED WILLOW IN THE PRAIRIE PROVINCES
(? - Unconfirmed Lynn Lake record)

Manitoba Lowlands of Saskatchewan. The area had been burned and there was a prolific growth of young willows on the fertile lowlands. We noted one patch containing three species of willows all about 15 feet tall and with small trunks - Pacific Willow (*Salix lucida* ssp. *lasiandra*). Sandbar Willow (*Salix exigua* including *S. interior*) and the Peach-leaved Willow. Older and larger trees of the latter had no doubt been destroyed by the fire.

In addition to the above reports of the Peach-leaved Willow in boreal forest the species also occurs, mostly along streams, across the southern Canadian prairies. In Alberta the most northerly report is Empress.⁸ In Saskatchewan it extends north to Eston (Hooper 84082003, 20 August 1983). In Manitoba Scoggan reports the species north to Lynn Lake⁹ but that report may be in error (G. Argus, A. Breitung, pers. corr.). The species does occur north to the Riding Mountains,³ and also to Lac du Bonnet¹⁰ (50 miles NE of Winnipeg). Since these northern Manitoba locations are in boreal forest it is possible that the species' range extends into east-central Saskatchewan from the south-east as does the Bur Oak (*Quercus macrocarpa*) which also has outliers in this area.⁵

Except for the introduced Weeping Willow (*Salix babylonica*) the Peach-leaved Willow is the only one in the Prairie Provinces referred to as having slender twigs and drooping leaves.¹⁻⁶ However, this is not always the case. On 27 June 1983, at the Armit river east of Hudson Bay on flood plain and gravel bars I found willows with drooping leaves, but when I sent the duplicate (Hooper, Baker & Harms 83062711) to Dr. Argus the specimen was identified as Yellow Willow (*Salix lutea*). Checking more thoroughly I noted that it had prominent stipules. The Peach-leaved Willow has inconspicuous stipules which soon wither away.

- ² BREITUNG, A.J. 1957 Annotated catalogue of the vascular flora of Saskatchewan. The Am. Midland Naturalist 58(1):1-72
- ³ CODY, W.J. 1983 Checklist of the plants of the Riding Mountains, prepublication copy.
- ⁴ FRASER, W.P. 1942 Notes of the willows of Saskatchewan. Can. Field Nat. 56.
- ⁵ HOOPER, D.F. 1981 Bur Oak, Nannyberry, Sandcherry and other interesting plants of east-central Saskatchewan. Blue Jay 39(2):69-72.
- ⁶ LOOMAN, J. and K.F. BEST 1979 Budd's Flora. Research Branch, Agriculture Canada
- ⁷ MACPHEDRAN, D. 1983 Peach-leaved Willows in Saskatchewan. Blue Jay 41(1):10-11
- ⁸ PACKER, J.G. 1983 Flora of Alberta (Revised from Moss). University of Toronto Press
- ⁹ SCOGGAN, H.J. 1978 The flora of Canada. National Museum of Natural Sciences, Ottawa.
- ¹⁰ SCOGGAN, H.J. 1957 The flora of Manitoba. National Museum of Canada Bull. 140

ADDENDUM: Argus later identified as Peach-leaved Willow a collection from Mountain Cabin, close to the Carrot River about 2 mi. south of the above mentioned Bainbridge River collection (Hooper & Baker 84071714).

¹ BREITUNG, A.J. 1951 Key to the willow of Saskatchewan. Blue Jay 9(4):24-26.

FOSSIL VERTEBRATES IN THE EASTEND MUSEUM

TIM TOKARYK, Earth Sciences, Saskatchewan Museum of Natural History, Wascana Park, Regina, Saskatchewan. S4P 3V7

The fossil vertebrates in the Eastend Museum, Eastend, Saskatchewan, not only have an ancient history of their own, but have also been important in Eastend's history. The small museum, organized and maintained by volunteers, has survived many long years, starting from a collection in the basement of the self-taught curator, H. S. "Corky" Jones and today occupying an old theatre. Living through a flood and continual lack of funds for upgrading, this little museum has survived many setbacks. Credit is due to the numerous volunteers and to Corky Jones for collecting, preparing and maintaining the small but impressive collection of fossil vertebrates.

In 1984 the author (with the approval of the Saskatchewan Museum of Natural History) spent a week in Eastend cataloging and repairing the collection. The following is a checklist of the fossil vertebrates on display.

EDITOR'S NOTE: For those unfamiliar with the symbols M refers to molar teeth, P to premolars, the numbers note the position of the tooth in question, with superscripts referring to the upper jaw, subscripts to the lower. The EM P designation is the paleontology collection of the Eastend Museum with collection number for each specimen.

CLASS **Mammalia**

ORDER Perissodactyla

FAMILY Brontotheriidae

mandible P₄, M₁₋₃ (EM P1.1)

left mandible (EM P21.1)

humerus (EM P22.1)

five horn fragments (EM P30.1,

EM 31.1, EM P32.1, EM 33.1,
EM P34.1)

maxilla fragment (EM P35.1)

scapula (EM P36.1)

three cervical vertebrae (EM P37.1,
EM P38.1, EM P39.1)

complete mandible (EM P40.1)

left mandible (EM P41.1)

fragment of mandible (EM P42.1)

nasal fragment (EM P43.1)

metacarpal (EM P44.1)

two tibiae (EM P45.1, EM P46.1)

fused ulna and radius (EM P47.1)

FAMILY Rhinocerotidae

cervical vertebra (EM P48.1)

Trigonias species (sp.) complete
mandible (EM P49.1)

CLASS **Reptilila**

ORDER Ornithischia

FAMILY Hadrosauridae

eight weathered caudal vertebrae
(EM P2.1, EM P3.1, EM P5.1 EM P7.1
- five caudal vertebrae)

three articulated caudal vertebrae
(EM P4.1)

four articulated caudal vertebrae
(EM P6.1)

two metapodial bones (EM P11.1,
EM P12.1)

FAMILY Ceratopsidae

dorsal vertebra (EM P10.1)

cast of a scapulacoracoid (EM P14.1)

Triceratops sp. partial skull (EM P15.1)

portion of a supraorbital horncore
(EM P19.1)

Torosaurus sp. frill (EM P16.1)

FAMILY Thescelosauridae

lower limb (EM P8.1)

ORDER Saurischia

FAMILY Tyrannosauridae	<i>Aspideretes</i> sp. nearly complete carapace
caudal vertebra (EM P23.1)	(EM P20.1)
distal end of a metapodial (EM P24.1)	shell fragment (EM P18.1)
ORDER Eosuchia	FAMILY Dermatemydidae
FAMILY Champsosauridae	<i>Basilemys</i> sp. partial carapace (EM P25.1)
<i>Champsosaurus</i> sp. dorsal vertebra	fragment of a shell (EM P26.1)
(EM P17.1)	ORDER Sauropterygia
ORDER Chelonia	FAMILY Plesiodauridae vertebra
FAMILY Trionychidae	centrum (EM P27.1)

CORRECTION to Collecting Vertebrate Palaeontological Specimens in Saskatchewan

TIM TOKARYK, Earth Sciences Department Saskatchewan Museum of Natural History, Wascana Park, Regina, Saskatchewan. S4P 3V7

In the June, 1984 Issue of Blue Jay [42(2):75-76] I authored an article on the legality of collecting fossil vertebrates in Saskatchewan. Recently, I received word from Pat Froese of the Heritage Conservation Division that there should be a few corrections:

- 1) The Heritage Property Act was passed November 28, 1980, not 1979
- (2 In 1982 the deadline for registration was extended to November 27, 1985
- 3) Recently the act was amended to omit the confiscation of non-registered items. Section 66(2) now reads "All archaeological or vertebrate palaeontological objects found in or taken from the land of Saskatchewan other than those mentioned in subsection (1) are to be registered with the Minister on or before November 27, 1985.



Sunset

Lawrence Baschak

NOTES ON THE THERMAL FACTOR IN THE ECOLOGY OF THE BEET WEBWORM

L.G. PUTNAM, 35 Kirk Crescent, Saskatoon, Saskatchewan. S7H 3B1

Having no internal mechanism for controlling body temperature, insects, with a few exceptions, are subject to whatever the environment offers with respect to heat. The active stages may gain an advantage in our difficult conditions by exposing themselves to sunlight or extra warm micro-habitats. For example, our pest grasshoppers do best at about 30°C, and without what they can gain by basking on a warmed-up soil surface in cool sunny weather, they would never make it. Dark colouration may confer an advantage by improving absorption of direct solar radiation. The Beet Webworm (*Loxostege sticticalis* L., Lepidoptera:Pyralidae) may be a case in point, since its caterpillars live in the plant canopy, and are not on the soil except when marching. Eggs incubating in the soil, for example those of grasshoppers, and pupae, as in the cocoon of the Beet Webworm, cannot of course adjust; if the soil is shaded by vegetation, progress of development is slowed.



Figure 1. Beet Webworm moth on Lamb's-quarters foliage.

Information in the literature on temperature and development in the beet webworm seemed to be fragmentary. The experimental results obtained by the author and presented here are intended to contribute to an understanding of some phenomena related to this species as observed under natural conditions. In another paper, the interaction of temperature and photoperiod in their effects on diapause, the resting stage that the insect may enter, has already been described.¹ Here, I propose to discuss the effects of temperature on rate of development in Beet Webworm.

To provide data for a time-temperature development curve, rearing from the newly-laid egg through the newly emerged moth was carried out in rearing cabinets at a series of controlled temperatures: 19.5, 20, 20.5, 26, and 30°C. Times required for development were respectively 58, 52, 42, 29, and 24 days. These results were of course obtained under photoperiods intended to avert diapause. The three lowest temperatures in the series were closely spaced because it was known that response was sensitive in that range. By extrapolation, it was roughly estimated that the threshold temperature at which development would begin was about 13°C, but it seems clear that even if development could proceed at that temperature, four or five months would be needed to complete it.

For each whole numbered temperature between 13 and 30° inclusive, the time required was read off the curve. The percentage of the development accomplished per hour was then calculated. For 13, 14,30°C these percentages were .032, .040,

.....0.173. These were designated as "hourly developmental increments", and applied later to the results of rearing at fluctuating temperatures.

To investigate fluctuating temperature effects, cultures were reared under two different daily cycling temperature regimes: 9-11 to 25-26, and 16 to 29-30°C. As the programs were designed, no development would be expected for about 9 hr/day under the cooler one. About 74 days were needed to complete development under the cooler program, and 36 under the warmer one. When the calculated hourly increments for each hourly temperature, as recorded on the thermograph, were accumulated, the total accounted for about 95% of the observed time for the cooler program, and 103% for the warmer one. Thus the agreement between the expected and observed times was good, although imperfect. Some of the error might have arisen from the crudeness of extrapolation below 19.5°.

In all time-temperature experiments, it was noted that very nearly half the total time in immature stages was spent in the cocoon.

It will be realized that the developmental period as dealt with here does not embrace the entire life cycle, from egg to egg. The pre-oviposition period in the adult

moth was not investigated. Under natural conditions, it may be variable.

The results obtained from experiments with cycling temperatures tend to indicate that rate of development is simply the result of accumulated temperature-related developmental increments, with negligible effects attributable to the fact of fluctuation itself.

From the results given here, it would be surprising if the total development of a non-diapausing population in the field could be completed in less than two months. Therefore, a second generation within one season would have to be preceded by an early first one in order to have any success. It is more likely that a second generation either seldom develops or is insignificant in Saskatchewan latitudes.

Light trap captures of beet webworm moths have been recorded for several years and from several points in Saskatchewan. The moth flight usually begins early in June. It may rise to a peak by the middle of the same month, and be followed by another peak a month later; or, the first peak of flight may not occur until mid-July, perhaps followed by another in August. The first or the second peak may be the higher. There is very little evidence of year-to-year regularity in the pattern. The evidence of

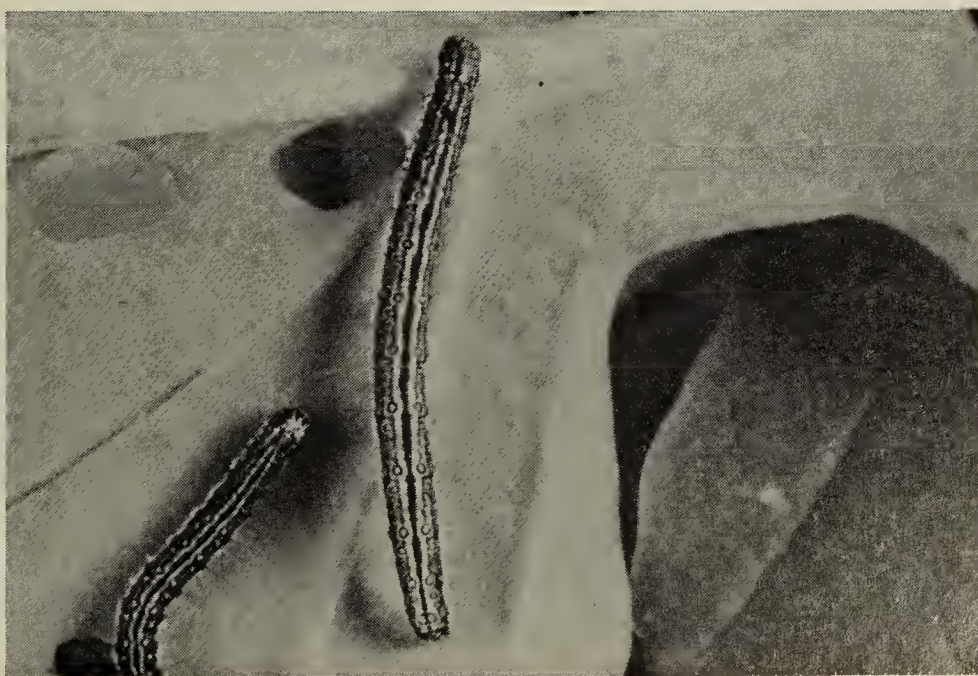


Figure 2. *Beet Webworm caterpillars on rapeseed foliage.*

the time required to complete a generation contradicts the temptation to think that the successive peaks represent successive generations. If all the facts of the temperature experience of a population in the cocoons could be known, it might account for a first flight peak in July instead of June, for example, but might not account for two flight peaks separated by a month. Our present knowledge is simply inadequate for an hypothesis concerning this.

The author used equipment and facilities of his former employer the Agriculture Canada Research Station at Saskatoon, in performing the experiments described in this paper. He acknowledges the invaluable assistance of Charles G. Devlin, technician, in their performance.

¹ PUTNAM, L.G. 1984. Diapause in the beet webworm. Blue Jay 42(1):22-24.

CHINESE ELM — A NEW FOOD PLANT FOR THE MOURNING CLOAK BUTTERFLY

WALTER KRIVDA, P.O. Box 864, The Pas, Manitoba. R9A 1K8

Chinese Elm is a rapidly growing foreign tree brought into the Pas area in the past 10 years. It winters well here and seedlings are starting to appear in gardens and along buildings from the adult trees. It has all the appearance of becoming a weed tree and is so treated now by the Saskatchewan Department of Agriculture.

It was something of a surprise this past August to find several dozen almost fully grown larvae of the Mourning Cloak Butterfly on a Chinese Elm hedge on 3rd Street in town. With the able assistance of my six-year-old nephew, Kevin Krivda, we collected some 60 spined larvae and kept them with fresh elm leaves in a large covered cardboard box in the greenhouse. This was 18 August. By 25 August most had pupated. A week later butterflies were flying all through the greenhouse. We released many by leaving the doors open but preserved a good set for future study. They were a shade on the small side either due to our drought this year, or that the Chinese elm was partly unsuitable to them as diet.

Most years large, fully grown larvae can

be easily collected along the Saskatchewan River. Here they feed on Sand-bar Willow. This may be the normal food for the Mourning Cloak in these parts. Only once did I see a colony of larvae on Trembling Aspen.

There is only one other local record of Mourning Cloak larvae on Chinese Elm trees. These were about 20 feet up in the tree in August 1979. The sudden switch of an insect to a new food plant is always worth recording.

EDITOR'S NOTE: Although Mourning Cloaks prefer willows for their food-plants, they will also feed on poplars and elms, especially in urban areas where there are fewer willows. In fact in some areas they have been so involved in feeding on American Elm, (*Ulmus americana*) the caterpillar has been called the "Spiny Elm Caterpillar". On July 4, 1984, Bill Hausecker, of Maryfield, Saskatchewan, pointed out to me (Ronald Hooper) a colony of Mourning Cloak caterpillars in his backyard which were feeding on Siberian (Manchurian) Elm (*Ulmus pumila*).
- R. Hooper

GOLDEN EAGLES NEST SUCCESSFULLY IN TREES

C. STUART HOUSTON, 863 University Drive, Saskatoon, Saskatchewan, S7N 0J8 and KELWIN A. WYLIE, 43-24 Central Place, Saskatoon, Saskatchewan. S7N 2S2

The Golden Eagle in Saskatchewan is typically a bird of the drier river valleys and "badlands." The overwhelming majority of pairs build their nests on steep clay banks of rivers and their tributary coulees. Between 1960 and 1984 Houston banded 107 young in 72 successful cliff nests. Even in northern Saskatchewan, Golden Eagle sites have been on rocky ledges, avoiding use of the universally prevalent trees.²

Twice, ranchers have taken us to an "eagle nest" in a tree on the plains but each time the birds proved to be Ferruginous Hawks. We have heard, after the event, of one seemingly authentic

report of a pair of Golden Eagles nesting in a large cottonwood in the South Saskatchewan River Valley within 50 km of Leader. Edward Arnold also found a pair nesting in a willow in the McDonald Hills north of present Dysart in late June 1885.¹

In 1977 the cliff-nesting pair near Riverhurst, after failing to produce young in 9 of 12 successive annual attempts, no doubt partly because of disturbance from fishermen's boats immediately below their traditional nesting site after the filling of Lake Diefenbaker, attempted to nest in a tree. A large new nest was built 22 feet from the ground in an introduc-



Figure 1. *Adult Golden Eagle on nest near Matador*

C.S. Houston



Figure 2. *Kelwin Wylie banding eaglet*

Bruce Tomlinson

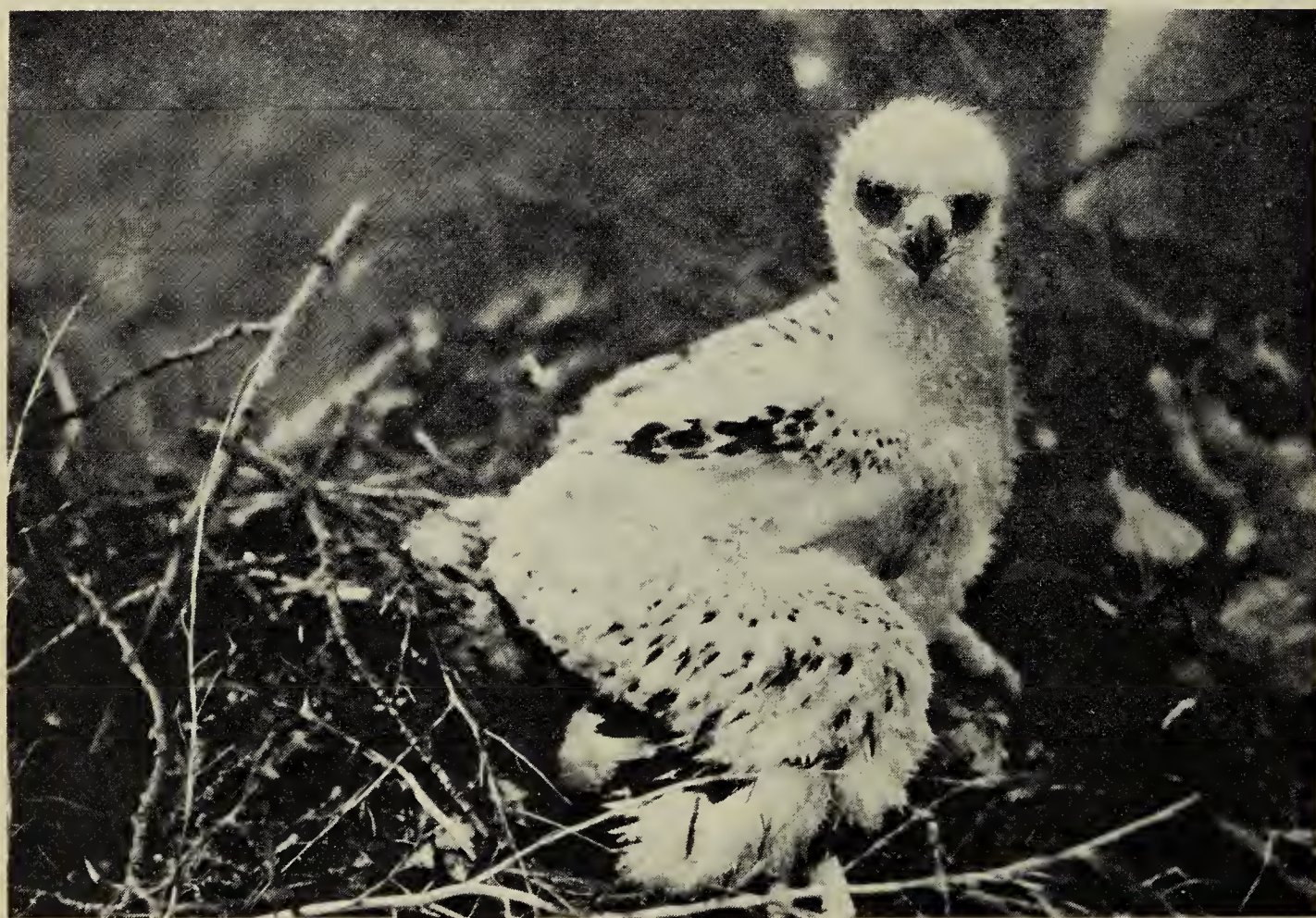


Figure 3. *Young eaglet in nest*

C.S. Houston

ed European White Poplar in a deserted shelter belt about a mile from the river. The adult eagle sat tightly on the nest while Lorne Hamilton seeded the surrounding field on 20-22 April. The eagle showed no fear of the tractor. However, when the tree was climbed on 4 June it contained a Mallard incubating four duck eggs. Clearly the eagle had abandoned her attempt sometime during May.

Not until 1984 did we visit a successful Golden Eagle nest in a tree. Indeed, half of the known successful pairs in 1984, two of four, nested in trees, all well away from the river. On our eagle banding trip of 9 June we went first to the nest found by Dan Zazelenchuk on the Co-op ranch near Matador. The nest was less than a mile from farm buildings and 8 miles north of the river. It was 18 feet from the ground in an introduced European Poplar (Fig. 1). The single, good-sized downy eagle was banded (Fig. 2,3). Dan informed us that his nest had also been used by the eagles in 1983.



Figure 4. *Adjacent successful nests of Black-billed Magpie and Golden Eagle northwest of Swift Current; Bruce Tomlinson in foreground*
Kelly Wylie.

The second nest was in a smaller pasture, northwest of Swift Current and 20 miles south of the river. The eagle nest was 22 feet from the ground in a Green Ash, only 5 feet above an active Black-billed Magpie nest in which we banded three young. It had been found by Derek Kreuger. Two downy eaglets were banded.

Later, on 3 July, Houston was shown a third Golden Eagle nest in a very large willow tree about 20 feet from the ground on the ranch of Joe Letournus southeast of Val Marie. This nest, only half a mile from the United States boundary, had raised two young in 1983. Houston had scouted a shelter belt less than 4 miles north of there 9 July 1983 when searching for Ferruginous Hawk sites and had found a Northern Mockingbird singing. We wish we had known of the site four miles to the south, although the young eagles would probably have fledged by the end of June.

¹ HOUSTON, C.S., and M.J. BECHARD. 1982. Edward Arnold, enthusiastic oologist. *Blue Jay* 40:184-192.

² WHITFIELD, D.W.A., D.W. DAVIS, J.M. GERRARD, and W.J. MAHER. 1969. Golden Eagles in central Saskatchewan. *Blue Jay* 27:74-79.



Figure 5. *Stuart Houston banding eaglets*
Bruce Tomlinson

SUMMARY OF 1984 WHOOPING CRANE STUDIES

E. KUYT and J. PAUL GOOSSEN, Canadian Wildlife Service, # 1000, 9942-108th Street, Edmonton, Alberta. T5K 2J5

The annual winter inventory of Whooping Cranes on the Aransas National Wildlife Refuge near Corpus Christi, Texas had not been completed, and although it is possible that one or two birds may have been overlooked or have not yet arrived, for practical purposes the entire Wood Buffalo National Park population had completed its fall migration and was in its winter residence.

The results of aerial surveys carried out by refuge biologist T. Stehn have confirmed September 1984 Canadian Wildlife Service reports stating that a record crane population, including 13-15 chicks, was expected to reach the Texas coast. Late December and early January counts at Aransas indicate a population of 84 birds (75 in 1983), including 15 chicks (7 in 1983). The previous high was established in 1980 when 78 birds wintered at Aransas. The juvenile complement of 15 birds surpasses the former record of 12 chicks set in 1976.

Canadian Wildlife Service surveys over the breeding range in Wood Buffalo National Park in 1984 located 29 nests, all but one containing the customary clutch of two eggs. On 21 and 23 May we removed 25 surplus eggs and transferred these to the Grays Lake National Wildlife Refuge in Idaho where 22 of the eggs were placed in nests of Greater Sandhill Cranes. Before shipment from Fort Smith, N.W.T., we tested all collected eggs (about one week from hatching) by means of flotation and found that only two eggs showed no evidence of life. These two eggs and a third live egg were shipped to the Patuxent Wildlife Research Centre near Laurel, Maryland, for analysis of the dead eggs. The live egg hatched and the chick was added

to the captive whooper population which now numbers about 35 birds. Of the 22 eggs placed in sandhill nests in Idaho, 19 hatched and 10 chicks eventually flew from the Grays Lake Refuge. About 35 Whooping Cranes make up that population which winters on or near the Bosque del Apache National Wildlife Refuge in New Mexico. Pairing of birds in that population has been observed a few times but prolonged associations have not yet occurred.

After the removal of the 25 surplus eggs, 32 eggs remained in nests in Wood Buffalo National Park. Two eggs laid by an early nester hatched on or about the day of pick-up and the last three nests with full clutches were not visited because of failure of the pick-up helicopter's engine. The prolonged stay of the damaged helicopter near one nest discouraged the incubating bird and forced us to remove both eggs. Two of the four pairs whose nests were not visited hatched both their eggs but sometime between June and late July each pair lost one of its young. Both pairs are now in Texas with their chicks. The two eggs in the third nest not visited were missing during an aerial survey after the egg pick-up and aerial observations near the fourth nest indicated that the two eggs or chicks were lost between 23 May and 5 June 1984, perhaps as a result of predation.

Of 24 *single* eggs remaining in Wood Buffalo National Park after the pick-up, 21 are known to have hatched. Two addled eggs were collected on 6 and 21 June. On the latter date 20 chicks were still alive. Only a single chick is known to have died between 21 June and 31 July and a second chick may have disappeared shortly thereafter. On 4 August we captured and

colour-banded 13 of 18 chicks known to be in the area. Ten of the banded chicks and five unbanded ones are currently on the winter range. One of the missing colour-banded juveniles was seen in Wood Buffalo National Park as late as 11 September, when it should have been capable of flight and safe from terrestrial predators.

The large number of chicks produced in 1984 is a direct result of recent increases in the breeding population combined with improved habitat conditions in 1983 and 1984. Satisfactory survival of colour-banded juveniles from 1977-1979 (and perhaps

from the 1976 cohort) have resulted in these birds "graduating" to the breeding segment of the population. This has resulted in increases of 26 and 21 percent in the number of breeding pairs in the last 2 years to the current 29 pairs.

Over the years to come, the reported sighting of colour-banded birds will contribute immensely to our understanding of distribution, migration, habitat selection, nest site fidelity and many other factors important to the continuation of our cooperative efforts in Whooping Crane conservation.



Whooping Cranes, Avonlea, Saskatchewan

Lorne Scott

THAYER'S GULL ON LAKE KATEPWA,

FRANK H. BRAZIER, 2657 Cameron Street, Regina, Saskatchewan. S4T 2W5

During the afternoon of 18 April 1984 Manley Callin, John Nelson, Joe Thomson and I were at the west end of Lake Katepwa in the Qu'Appelle Valley glassing a sandbar which was crowded with loafing gulls, practically all of which were adult Ring-billed Gull. In my scope one of them facing us clearly had pink legs and that part of its mantle which could be seen was darker than its close neighbour, a Ring-billed Gull, so I directed the attention of the others to what I thought was a Herring Gull.

As we studied it, the bird moved its head so that we had a profile view. We could then note the relatively small bill with the red spot at the end, the small head and its dark eye.

John reached for Peterson then handed it around opened at page 87, pointing out as he did so that the only dark-eyed, pink-legged gull in adult plumage was Thayer's Gull.⁵ It was a lifer for all of us! It was the first one reported to Manley for the Qu'Appelle Valley.

Thayer's Gull is on the Saskatchewan list by virtue of a specimen obtained by R.W. Nero 9 June 1960 near Beaverlodge Lake, just north of Lake Athabasca in northern Saskatchewan.⁴ It was then considered to be a subspecies of the Iceland Gull and was named *Larus glaucoides thayeri*. W.E. Godfrey formally recognized Thayer's Gull as a valid species in 1966 when "The Birds of Canada" was published.¹

Fortunately our bird was in full breeding dress and not in the more confusing subadult plumages. The identification of subadults can be a formidable task according to Lehman, and Gosselin and David.^{3 2}

Although we did not see the bird in flight we had three field marks on an adult so we

considered them to be sufficient. The dark eye and pink legs ruled out adult California Gull; the smaller head, finer bill and the dark eye ruled out adult Herring Gull; and the dark eye and dark mantle ruled out adult Iceland Gull.

- ¹ GODFREY, W.E. 1966. The birds of Canada. National Museums of Canada, Bulletin 203, Ottawa.
- ² GOSSELIN, M. and N. DAVID 1975. Field identification of Thayer's Gull (*Larus thayeri*) in eastern North America. American Birds 29(6):1059-1066.
- ³ LEHMAN, P. 1980. The identification of Thayer's Gull in the field. Birding 12(6):198-210.
- ⁴ NERO, R.W. 1983. Birds of the Lake Athabasca region, Saskatchewan. Saskatchewan Natural History Society Special Publication 5, Regina.
- ⁵ PETERSON, R.T. 1980. A field guide to the birds east of the Rockies. Houghton Mifflin, Boston.



First winter Thayer's Gull, Regina Beach
Chris Adam

ALBINO SANDHILL CRANE

STAN SHADICK, 3F-1800 Main Street,
Saskatoon, Saskatchewan. S7H 4B3

Following a successful trip north of Saskatoon 6 October 1984 to observe Whooping Cranes, Paul Coutu and I drove the tour group to the Outlook district, where they would be able to see many thousands of Sandhill Cranes congregating for the evening. The fields were indeed full of Sandhill Cranes and geese. A few young cranes were observed dancing with repeated jumps and much flapping of wings.

About half an hour before sunset, we noticed a white crane in a nearby flock of about 300 Sandhills. We stopped for further observation since there had been a Whooping Crane reported from the area. The bird appeared completely white except for a red forehead and brown wings. It lacked the dark cheeks of a whooper and stood exactly the same height as the other Sandhills. An adult Whooping Crane should have stood noticeably taller. Again, when the group of cranes flew to a night roost along the river, it was noted that the white bird was the same size as the other cranes. When flying it showed a white body and dark mottled wings with blackish primaries and secondaries. These features show clearly in photographs of the bird taken by Dr. Nigel Mathews of Ile a la Crosse.

The possibility of the bird being a hybrid Sandhill X Whooping Crane was suggested. However Ernie Kuyt of the Canadian Wildlife Service advised that captive hybrids produced by artificial insemination in Patuxent Maryland were a light uniform gray all over. They were totally unlike the bird in the Mathews photograph. It is most likely that the white bird was a partial albino Sandhill Crane.

I wish to thank Paul Coutu, Jim Slimmon, Brian Johns and the Canadian Wildlife Service for their assistance with the society-run tours. Ernie Kuyt provided helpful information and comments on the manuscript.

SAW-WHET OWL IN D'ARCY, SASKATCHEWAN

CAROL C. CLARKE, Box 23, D'Arcy,
Saskatchewan. S0L 0N0

On 6 November 1984, a Saw-Whet Owl flew into the D'Arcy Store when the owner let in her cat. It was very tame and sat on her husband's hand while he showed it to customers. Due to the traffic in the store, the cat, etc., the owl was placed in a bird cage for the night. The next day, it arrived at school. Because it had refused to eat any of the food offered, we decided that it should be released soon in a safe location away from the cats and dogs of town. Our retiring Unit Board Trustee, whose family had successfully raised a Great Horned Owl, came to our rescue. The owl was then released in an abandoned farm yard which contained large trees.

According to Renaud and Renaud's *Birds of the Rosetown-Biggar District*, Saw-Whet Owls are listed as "very rare vagrant visitor". In their booklet only four sightings are recorded and all of these are east of D'Arcy in the Rosetown and Biggar districts.

Although no photographs were taken of this owl, it was identified by three birders as being a Saw-Whet.



Saw-Whet Owl

Tony Johns

JUNIOR NATURALISTS

Are you bugged?, or have you been pestered lately? Who would guess I'm talking about poor little insects - listen to the names we give them. Not all insects bug or pester us do they?

What about our dear friend the honey bee. How many of you besides me like honey? Have you marvelled at the brilliant wings of the delicate butterfly, or the flashy colors on some beetles, or those water striders that really do walk on water!

There's lots of fascinating little animals out there. Get out your detective glasses and head out in search of the neatest insect you can find. Have you found it? Write down a few things about it so you can remember it and be able to compare it to someone different the next day.

How does it move?

What does it eat?

What was it doing?

What color is it?

Maybe ants will catch your attention. They'll follow trails to find food. Some mark the trail with a special scent called a pheromone so they can find their way back to the nest, others find their way by using the sun or a landmark. Imagine being ant sized and having to navigate in the big world! Do you find their trails?

Once a couple of ants find food they try to drag it back to their colony. Other ants come to help, but often there seems to be a time of confusion, they pull, but in the wrong direction! Soon though, all ants are working together.

Keep a sharp eye on your insect, maybe it will do something that surprises you! I'd like to see your list of observations and why you think this insect is 'neat'. Observations are important, so send them to me and we'll

print them in the next Blue Jay! Keep a list for yourself of how many different insects you find over the summer.

A couple of great books to get are: *A Guide to Observing Insect Lives* by Donald W. Stokes and, the first issue of 'Nature Scope', a new magazine affiliated with 'Ranger Rick'. It is packed full of information and great activities. Each issue is a different topic. I'm excited to see them. Their address is **NatureScope, Dept. 177, National Wildlife Federation, 1412 Sixteenth Street, N.W., Washington D.C. 20036.** Heidi Sutherland, 901-2020 Bellevue Avenue, West Vancouver, British Columbia. V7V 1B8.



Green Lattice Moth

R.E. Gehlert

NATURE LIBRARY

ARCTIC ORDEAL — The Journal of John Richardson, surgeon-naturalist with Franklin, 1820-1822.

Edited by C. STUART HOUSTON, with illustrations by H. ALBERT HOCHBAUM. McGill-Queen's University Press. xxxiv, 349 pp. 1984. \$29.95 (Available from the Blue Jay Bookshop, Box 1121, Regina, for \$26.95).

Dr. Houston has presented us with another excellent volume on the somewhat less famous, but no less intriguing first Franklin expedition. Almost ten years to the day since publication of his *To the Arctic by Canoe* (McGill-Queen's University Press, Montreal, 1974) this volume amazingly covers very little of the same material since Richardson's journals begin on 21 August while those of Hood which were dealt with in *To the Arctic by Canoe*, end on 13 September. Thus this current volume is not a duplicate of the previous, but an extension, beginning where the previous one left off.

John Richardson in his journals recorded the day to day activities of the expedition as well as his own record of specimens and observations on the long trek northward into previously unexplored land. It is a story of the trials and tribulations of a group of 20 men which set out and of the 9 who were still alive on their return. Unlike Franklin's narrative, Richardson's journals provide a personal record, not designed for public viewing as was Franklin's. Richardson's journal thus tells us in an informal and readable style the events of the last year of the expedition. This, combined with Dr. Houston's knowledgeable commentary, provides for an interesting and vivid account which is of interest not only to the specialists but to anyone interested in history of northern exploration.

The format is attractive and is enhanced by a series of excellent maps and realistic sketches by Albert Hochbaum. There are six appendices — four by Houston on birds, mammals, fish and plants and one on lichens by John W. Thomson and another on geology by Walter O. Kupsch.

Overall, I was impressed by this book. It is well edited and produced, and by comparison on today's market, very reasonably priced. Highly recommended. — Reviewed by *Wayne C. Harris*, Box 414, Raymore, Saskatchewan. S0A 3J0

CHARLES BROLEY: An Extraordinary Naturalist

JON GERRARD 1983 White Horse Plains Publishers, Headingly, Manitoba. 58 pp. illus. \$4.00.

A biography of the man who sounded the alarm when DDT was reducing the reproductive success of the Bald Eagle, saving the species from the brink of extinction.

THE BALD EAGLE IN CANADA

Proceedings of Bald Eagle Days, 1983

Edited by JON M. GERRARD and TERENCE N. INGRAM 1985 White Horse Plains Publishers, Headingly, Manitoba. 272 pp., illus. \$20.00.

The Proceedings of Bald Eagle Days, 1983 presents status reports, and articles on management and research on Bald Eagles. In addition a special section on Charles Broley describes his impact on the studies of eagles.

FISHING IN THE WEST: A Guide to Alberta, Saskatchewan, and Manitoba. David Carpenter, 1984. Western Producer Prairie Books, Saskatoon, Saskatchewan. 185 pages plus many angling zone maps.

"One time, Dave Carpenter, visiting here from Alberta, drove with me into the Catskills, showed me a poisonous snake, told me the history of all these famous trout streams that he'd never seen but knows so much about." The note in Robert Kroetsch's *The Crow Journals* floated like a bit of flotsam in my mind although, at the time of reading, the word "trout" did not register, swimming away into the nether depths. What possible interest, I vaguely wondered, has David Carpenter - writer of fiction and professor of English - in the reverine environment, seeing that among the *literati* so few are alluvial fans?

With this book the mystery is solved. A true fisherman is drawn to streams and lakes, impelled whether in the Catskills or the Cypress Hills to read their waters, albeit in modern times by peering through polaroid sunglasses. He sees, beneath the surface, the sunflecked shallow riffles where the river runs straight, and the deep mysterious pools where it curves. He knows a thermocline from a thalweg.

And indeed, the author's "compleat" familiarity with his subject is well illustrated, offering something for every "Piscator:" - pictures, descriptions, and anecdotes about the nineteen most wanted fish of the prairie provinces, maps and lists of lakes and rivers where they can be found the methods of tying knots to assure that lures stay attached to lines, methods of ice fishing, and of fly fishing, as well as sections composed by Bill Robertson and Leroy Royer on the preparation, smoking and cooking of fish, and by Michael Taft on the folklore of angling, the latter compendium of illegal techniques employed by oldtimers to put meat on the table. A short list of references and a handy index of fishing subjects and fishing places completes the opus.

Most delightful are the first thirty pages in which Carpenter presents his intimate knowledge of western sports fish and their habits, rekindling in the memory of this boyhood fisherman the peculiar excitement (akin to the lust aroused by prospecting for gold) of angling in the rapids of the Oldman River for Mountain Whitefish, in the Highwood River for Culthroat Trout, and for Dolly Varden in Willow Creek back near the Livingstone Range in Alberta. The fishing rod, says Carpenter, is a magician's wand, and in the act of fishing something enchanting wells up. Thoreau spoke of the faint signals from the underworld transmitted through his fishing line "which come to interrupt your dreams and link you to Nature again", and Carpenter opines that the connection to nature can never be more intimate than at the moment when the fish takes the lure.

Then, realistically, he reneges on such hyperbole by remarking that "the hard part is teaching people to love the fish that they are trying to fool." No intimacy without affection. Descriptions of some of his fishing pals, as well as the cover photo showing a burly lad from the Great White North giving vent to that Toyota feeling, buoyed heavenward by a lunker pike in either hand, poignantly remind us that the passion for chasing fish (or waterfowl, or deer) is not inherently virtuous, gracefully balletic though the hunt may be when pursued with style. Thus there are good reasons for curbing the enthusiasm of fisherman in National Parks if, thereby, a more affective intimacy with Nature is encouraged.

Perhaps, however, as the tea-sipping lady remarked to her companion in the *New Yorker* cartoon showing a male in hot pursuit of a butterfly, "It's better than chasing you-know-what." Isaak Walton seemed to think so, but then, he too, was hooked —. Reviewed by J. Stan Rowe, Department of Crop Science and Plant Ecology, University of Saskatchewan, Saskatoon, Saskatchewan, S7N 0W0

LETTERS

SKULL CREEK OBSERVATIONS IN A YEAR OF DROUGHT

Midsummer of 1984 brought the longest continuous spell of hot weather that I have experienced since I came west in 1922. Water sprayed on the garden seemed to evaporate as fast it was put on and there was little growth. In later summer the grasshoppers ate what was left. The carrots and beets were just spikes. Fortunately the grasshoppers seemed to have an aversion to roses, pansies and some English phlox, so I had a few cut flowers.

During the severe drought of 1937 we were also afflicted with grasshoppers. My late husband, Steve, came all smiles one day that year and said "The grasshoppers are nearly gone." Hundreds of gulls had settled across a field in a long row, all facing the same direction, eating as they moved ahead. The ones behind would move up in front, so that they were moving in a rolling motion across the field. Occasionally some gulls would go to the creek for a drink.

In 1984 I noticed hundreds of crows on the big hill in front of our house. They were all facing the same direction and going through the same rolling motion as the gulls had done in 1937. On another day my daughter-in-law, Betty, watched the same phenomenon. After that we had few grasshoppers left.

In my wanderings over the hills, there were no lovely waving grasses, silvery weeds, or flowers — just the cracked earth with wisps of dried grass that crumbled beneath the feet. We had no crop except for a little hay on sub-irrigation land. Insects were more prevalent than other years.

Blister beetles cleaned the leaves off all the honeysuckles. I left the beetles alone, and learned to live with mere skeletons of honeysuckles, because I know that blister beetles are also enemies of grasshoppers. Small insects were more prevalent as well.

When I was working in the garden, small midges would get beneath my glasses, in my eyes and hair and in my clothing. One day in the garden I looked down. The ground at my feet seemed to be moving. Hordes of black ants were all travelling in the same direction, in a uniform column about eight inches wide. They were like a platoon of marching soldiers. The line was at least 30 feet long. On another day I observed a column of red ants, each of which carried a little white egg.

For the first year since 1922, I did not have a House Wren in my bird house. There was no wren to waken me in the morning, its little throat bubbling with cheery song.

Also, we lost our apples and plums, for their blossoms froze hard in the late spring snowstorm. On the other hand, this snow melted in the low areas along the creek, resulting in the best crop of gooseberries, saskatoons and black currants in years.

This year there are many more deer — hundreds between here and Maple Creek. Motorists beware! Sixty, mostly does and fawns, were counted on our homestead one day — most years we would have about a dozen, back in the woods. I looked out my kitchen window one morning and saw a beautiful buck enjoying the cotoneaster berries. He looked unconcernedly at me and ambled off. In fact, this year there are more deer than we care to feed, since we have to import all our expensive hay and food pellets from as far away as Prince

Albert. Why the deer chose our barren pastures this year is hard to understand unless they were driven south by the prairie fires north of the Trans-Canada highway. — *Marjorie Mann*, Box 250, Piapot, Saskatchewan. SON 1Y0

BANK SWALLOW TENANTS, RUFFS AND REEVES.

Regarding Dale and Paule Hjertaas' trespassers on Bank Swallows (Blue Jay 42 (4): 210-211), with Rob Owens and his wife and Richard Palindat, I saw House Sparrows wintering in Bank Swallow holes about 20 miles east of Calgary one winter around 1973. None of us had seen such a thing elsewhere, but in most areas of the east there would be no foraging for House Sparrows around most Bank Swallow colonies.

Regarding Reynolds' displaying Ruff and Reeves at Churchill (Blue Jay 42 (4): 219-221), one of each, were around Cape Jourimain NWA, New Brunswick, for most of the summer of 1972, with no other breeding evidence; a male was present for part of the following summer. So his is another inconclusive observation, though in more likely habitat. — *A.J. Erskine*, P.O. Box 1327, Sackville, New Brunswick. EOA 3CO

RAPTOR MISIDENTIFICATION

I enjoyed the article in Blue Jay on trees and the Red-tailed Hawk (Houston, Blue Jay 41 (2):99-109). But the editor mislabeled the raptor on page 104. It is an immature Swainson's Hawk, not a Red-tailed Hawk. — *Bill Clark*, 9306 Arlington Boulevard, Fairfax, Virginia. 22030

NOTES FROM WHITE BEAR

Our ducks and geese left us a month earlier than usual, with the advent of early winter. Now in December (letter of 21 December) we have at least three Northern Goshawks visiting the bird feeders and harassing the pigeons almost daily. They certainly make the Ring-necked Pheasants, Sharp-tailed Grouse and Gray Partridge wary. I am amazed at the speed the goshawk can attain on a short run — it will overtake a pigeon quite handily, and if the pigeon could not manoeuvre so well, it would be doomed every time. Luckily the goshawk cannot keep speed up for long, so soon lands and waits for the pigeons to settle down, then tries again. I find the goshawk a far greater threat to the pigeons than any of the falcons. I have never seen a goshawk pursue anything smaller than a pigeon or partridge. The goshawk totally ignores Black-billed Magpies, in fact a magpie will come within a foot of the goshawk and pick up morsels of its prey.

Deer make themselves right at home here and often bed down right by the house. When I do chores they are right with me looking for a little oats. I snapped the enclosed picture of a spike buck that was watching me through the window. — *Sig Jordheim*, White Bear, Saskatchewan. SOL 3L0



